AMERICAN ANTIQUITY

EUM LIBRARY AUG 6 19
E
51
.A495

VOLUME XI
NUMBER I
JULY 1945

PUBLISHED BY THE SOCIETY
FOR AMERICAN ARCHAEOLOGY

THE SOCIETY FOR AMERICAN ARCHAEOLOGY

OFFICERS

President: CARL E. GUTHE, New York State Museum, Albany 1, New York.

First Vice-President: JAMES B. GRIFFIN, Museums Building, Ann Arbor, Michigan.

Second Vice-President: GREGORIO HERNANDEZ DE ALBA, Museo Nacional de Arqueología, Bogotá, Colombia.

Secretary: WALDO R. WEDEL, U. S. National Museum, Washington 25, D. C.

Treasurer: FREDERICK JOHNSON, Phillips Academy, Andover, Massachusetts.

Editor: DOUGLAS S. BYERS, Phillips Academy, Andover, Massachusetts.

Associate Editor: FRANK H. H. ROBERTS, JR., Bureau of American Ethnology, Smithsonian Institution, Washington 25, D. C.

Assistant Editors: HENRY B. COLLINS, Arctic; E. W. GIFFORD, Pacific Coast; PAUL REITER, the Southwest; WALDO R. WEDEL, the Plains; JAMES B. GRIFFIN, the Northern Mississippi Valley; WILLIAM A. RITCHIE, the Northeast; WILLIAMS S. WEBB, the Southeast; GORDON F. EKHOLM, Middle America; WENDELL C. BENNETT, South America; FRANK H. H. ROBERTS, JR., Early Man.

Members of the Council: The President, First Vice-President, Second Vice-President, Secretary Treasurer, Editor, Associate Editor, and MATTHEW W. STIRLING and J. GILBERT MC ALLISTER to 1946, J. OTIS BREW, and J. ERIC S. THOMPSON to 1947, ELI LILLY and CHARLES R. KEYES, to 1948, GORDON F. EKHOLM and E. W. GIFFORD to 1949.

AMERICAN ANTIQUITY is printed by the George Banta Publishing Company, 450-454 Ahnaip Street, Menasha, Wisconsin, U.S.A.

Published by the SOCIETY FOR AMERICAN ARCHAEOLOGY, during the months of January, April, July and October. Subscription by membership, annual dues $4.00, includes quarterly issues of AMERICAN ANTIQUITY and other releases, as issued.

Entered as second-class matter July 22, 1935, at the post office at Menasha, Wisconsin, under the Act of March 3, 1879.

Manuscripts and publications for review should be sent to the Editor, Douglas S. Byers.

Subscriptions and orders for back numbers should be addressed to the Treasurer, Frederic Johnson.

Please address all requests for information to the Secretary, Waldo R. Wedel.

AMERICAN ANTIQUITY

VOL. XI JULY, 1945 No. 1

EDITORIAL

It is with some hesitation that we publish this issue of AMERICAN ANTIQUITY in a new format. Protests to the change will undoubtedly be strong, particularly on the part of librarians and others who will be faced with a problem in shelving succeeding volumes.

However, it was becoming evident that under the old format, the journal was not being printed in the most economical fashion. Furthermore, restrictions on paper consumption have become increasingly more severe. In our new format we realize a greatly increased economy of publication, and we reduce our consumption of paper at a time when every possible economy in this line contributes to a more complete utilization of a dwindling supply.

For some time the printer has been manufacturing the journal at a very substantial loss. We have been warned that it would be necessary to negotiate a new contract for publication of the journal. Were such a contract to be put into effect, it would result in cutting each issue of AMERICAN ANTIQUITY to approximately 64 pages, because it would not be possible, with our limited resources, to finance a larger number. Such a number would barely accommodate half of the papers now being submitted. It is obvious that AMERICAN ANTIQUITY would not begin to fulfill its obligations to the members of the Society for American Archaeology or to the field of archaeology were it to continue an extravagant format which prevented it from publishing the maximum number of papers.

It undoubtedly will be disappointing to many to see such a thin number of the journal. sixty-four pages is not nearly as impressive as ninety-six or one hundred twelve. Yet there is about seventy percent more text on a page of the current number than was possible on a page set according to the old format. This number is the equivalent of a one hundred twelve page number in the old format.

The paper mills have just announced that they can supply us with only forty-pound paper in place of the forty-five pound paper we have used for the last two issues. This further contributes to making this issue thinner than usual.

By this change in format, the Society is using its limited resources to the maximum. Due to greater economies in printing, it will be possible to continue publishing as many papers as we have presented in the past.

Costs of scientific journals have been studied by a committee whose report advises precisely the changes which appear in this number of the journal. It is quite probable that each dollar spent in printing now buys the maximum amount.

Substantial savings should also be realized in printing memoirs, some of which may run to considerable size. Thus it should be easier to publish these supplemental numbers, a condition which should please authors, readers, and the Treasurer.

We regret that it has been necessary to make this change, but we are confident that it will meet with approval. In last analysis, we have little choice. A saving of more than one hundred dollars in the cost of a number like the last October issue can be effected by our new format. No one can afford to neglect such an opportunity, particularly when his pocketbook is chronically deflated.

DOUGLAS S. BYERS, *Editor*

A SURVEY OF THE NORTHERN MAYA AREA

J. ERIC S. THOMPSON

IN A PREVIOUS article* in AMERICAN ANTIQUITY I have outlined the four main divisions of Maya history: the formative period (prior to A.D. 320); the Initial Series period, which is the classical age (A.D. 320–900); the Mexican period (A.D. 987–1204); and the Mexican absorption period (A.D. 1204–1540). I have also sketched briefly the three provinces into which the Maya area can be rather readily divided.[1] Nevertheless, it is difficult to place exactly the boundary between the central and northern areas. I have included in the former the various sites of southern Campeche—such as Calakmul—which are culturally a part of the Peten, and which appear to have been abandoned at the close of the Initial Series period. Yet Coba, which is in large part a typical Peten city of the Initial Series period, I have placed

FIG. 1.—The Northern Maya Area, showing approximate limits of architectural styles.

* Accents have not been indicated in this article. Yucatec words are nearly always accented on the last syllable.

[1] J. E. S. Thompson, 1943, pp. 106–107. To save space, citations are confined to recent works.

in the northern area (Fig. 1), because it lies so far north and is connected culturally with the northern area, and because it has buildings in late east coast style, indicating fairly intensive occupation in late times and close relations with such sites as Tulum. The boundary between the central and northern areas traverses the transitional region between the rain forest of the Peten and the drier tall forest to the north, but does not entirely coincide with it. The division is cultural rather than phytogeographical. Santa Rita might be placed in the northern area on architectural grounds, but ceramically it is part of the central area.

In the northern area there is a scarcity of hieroglyphic inscriptions, but in compensation we have the benefit of a written history, albeit sketchy and often self-contradictory. In arranging an archaeological sequence, it is necessary to anchor one or more archaeological periods to history and to work backwards and forwards from these on stratigraphical and stylistic evidence. Historical notes and traditions are contained in several books known as the books of Chilam Balam. *Chilan* or *Chilam* means prophet, and *Balam* (jaguar) was the name of a famous prophet who was credited with foretelling the Spanish conquest. As these books contained much prophetic material, they gradually came to be attributed to the prophet who had become famous. The books are differentiated by the names of the towns in which they were preserved; the most important are the books of Chilam Balam of Chumayel, of Mani, and of Tizimin, but much of the historical data given in the last two derives from a single source. They are written in the Yucatec language, but the script is European. None dates from earlier than the end of the seventeenth century, although the language used in some of the sections indicates that much of their contents is copied from earlier manuscripts.[2] The chronological tables, on the other hand, appear not to be of very great age. It is extremely probable that the originals were chants or sagas which may have been recited with the aid of hieroglyphic texts. These tables consist of a string of dates—the days which were the ending dates of a series of 20-year periods that are called katuns. With each date is a short paragraph relating the principal events of the time. Unfortunately, a katun can end only on one of thirteen different days. Accordingly, after thirteen katuns (about 257 years), the same ending date recurs. The transcribers of these chronological tables appear to have been faced with a problem such as some future archaeologist might meet if he found the historical notes " '20, Pilgrims land; '45, Bonnie Prince Charlie invades England; '12, Fort Dearborn abandoned; '65, Lincoln assassinated; '18, Battle of Chateau Thierry"; without any evidence as to the centuries in which those events occurred.

On the whole, the eighteenth century composers of the chronological tables did a pretty good job, but there are excellent reasons for believing that they made the tables too long, just as our future archaeologist might work back to 1520 as the date of the landing of the Pilgrims. The historical information must, therefore, be used with caution. It is necessary to build an historical framework from archaeological evidence, fitting into it traditions and chronological tables, avoiding, at the same time, choice of a favorite interpretation of tables and a forcing of archaeological evidence to fit it. Events prior to the Itza conquest of Chichen Itza are badly garbled. The chroniclers have the Itza, like the fairies in Iolanthe, "tripping hither, tripping thither. Nobody knows why or whither."[3]

The chronicles agree that the Itza under Kukulcan settled Chichen Itza in a katun 4 Ahau, remained there for two hundred years, and were then driven out. It is practically certain that the Itza were not Yucatec Maya, but foreigners. The facts that they are associated with Kukulcan—the word is a Maya translation of the Aztec "Quetzalcouatl," the name of the great Toltec hero who was later deified as god of the planet Venus—and that they are said to have introduced new weapons and a new religion make it virtually certain that they were either Mexicans or a Maya people who had come under strong Mexican influence somewhere in the vicinity of western or central Tabasco.

When, therefore, we find many buildings at Chichen Itza resembling to an amazing extent those found at Tula, Hidalgo, which tradition insists was the capital of Quetzalcouatl, we are quite safe in attributing them to the Itza and

[2] Roys, 1933, discusses these books in his introduction. For list, see Tozzer, 1917.

[3] Frameworks of Yucatecan history are in Roys, 1933; J. E. S. Thompson, 1937, 1941, 1943c; Morley, 1938; Andrews, 1943; and Escalona Ramos, 1944. The last two use a 11.3.0.0.0 correlation. See also Tozzer, 1941, various notes.

in referring them to the Mexican period or, more correctly, the period of Mexican influence. This period, in turn, can be dated in terms of ceramics and of the history of central Mexico, thereby enabling us to place the abbreviated dates of the chronicles in their true positions, viz., 10.8.0.0.0 (A.D. 987) for the start of the Mexican period and 10.19.0.0.0 (A.D 1204.) for the overthrow of the Itza and the end of the Mexican period. Since additions in Itza style have in some cases been made to structures of an entirely different style and since pottery of the Mexican period overlies earlier types, it is possible to place the earlier architecture and the earlier ceramic styles in the historical framework. The way is thereby cleared for that orderly sequence beloved by archaeologists and fitfully admired by sociologists.

FORMATIVE PERIOD

The earliest remains so far identified in the northern area are attributable to the Formative period, but not much can be said on the matter at this time. Dr. George Brainerd,who was engaged on a survey of Yucatecan ceramics, is now in the United States Navy. Publication of his conclusions must await happier days.[4]

Sherds resembling, in materials and shapes, pottery of the second phase of the Formative period in the central area (Uaxactun Ib, or Chicanel, San Jose I, etc.) have been encountered at a number of sites in Yucatan. There is also a sprinkling of sherds which appear to be attributable to the earlier phase of the Formative period in the central area (Uaxactun Ia, or Mamom). This pottery of the Formative period is marked by the complete absence of polychrome.

Trenches at Yaxuna (a few miles south of Chichen Itza) revealed that one enormous pyramid at that site was attributable to the Formative period, and there seems little reason to doubt that Maya culture was quite active in the northern area at that time. Such evidence for an occupation of Yucatan during the Formative period is important, for it disposes once and for all of the old theory that Yucatan was a vacuum during the Initial Series period, penetrated on a large scale by the Maya only after the end of the so-called "Old Empire." Indeed it is highly probable that the abandonment of "cities" of the central area was not accompanied by any mass depopulation of the surrounding country.

Until the publication of Brainerd's material, little can be said about the formative period in Yucatan save that there is evidence for a fairly long, widespread, and intensive occupation.

INITIAL SERIES PERIOD

Pottery of the basal-flanged bowl phase (Tzakol or Uaxactun II, San Jose II, etc.), corresponding to earlier stages of the Initial Series period, is rare in Yucatan and probably represents imports from the central area or the extreme south of the northern area. However, these imported wares date the local ceramics which are not directly related to those of the central area in this first part of the Initial Series period. In the second half, local pottery diverges even more from contemporary wares of the Peten (Tepeu, or Uaxactun III and San Jose III–V).

There are no less than five regional styles of architecture in the northern area which can be associated with the Initial Series period, either through direct archaeological evidence or inferentially. These are the early Peten, Puuc, Chichen Maya, Rio Bec, and Chenes styles. The first dates from the first half of the Initial Series period, the others, apparently, from the second half. Since the architectural differences certainly represent two horizons and may represent four or five political groupings, it will be necessary to review them briefly.

Early Peten Style

The earliest Initial Series date yet found in the northern area is inscribed on a stone lintel at Oxkintok, a large site in western Yucatan, southwest of Merida. The date falls in the katun 9.3.0.0.0 (A.D. 495). The early style in which the glyphs are carved is ample proof that the lintel was made at that date, and there can be no question of its being the record of some event in the past.

The masonry of the building in which the lintel had been placed, as well as that of many other (but not all) buildings at Oxkintok, resembles fairly closely the type of masonry at Uaxactun and other Peten sites which Robert Smith has termed Style 1. The characteristic

[4] Brainerd's interim reports are in Carnegie Institution of Washington Annual Reports for 1940–1942. See also Brainerd, 1941. Andrews, 1943, uses much unpublished material of Brainerd's, but it is essential to read Brainerd's emendations added as sheets of errata. See also Vaillant, 1933.

feature of this style is the use of large, well-cut but unfaced stones These are laid horizontally with their long axes set into the core (Fig. 2, *e*). The Maya vault is already in use, but the buildings have a solidity in strong contrast to the thin veneer masonry used later in much of the northern area.[5]

flanged bowl form does not appear to have been made in Yucatan.

Carved stone lintels were not used in the Peten, but were confined to the Usumacinta Valley, so it is possible that Oxkintok was influenced from the latter area more strongly than from the former. Until more is known of

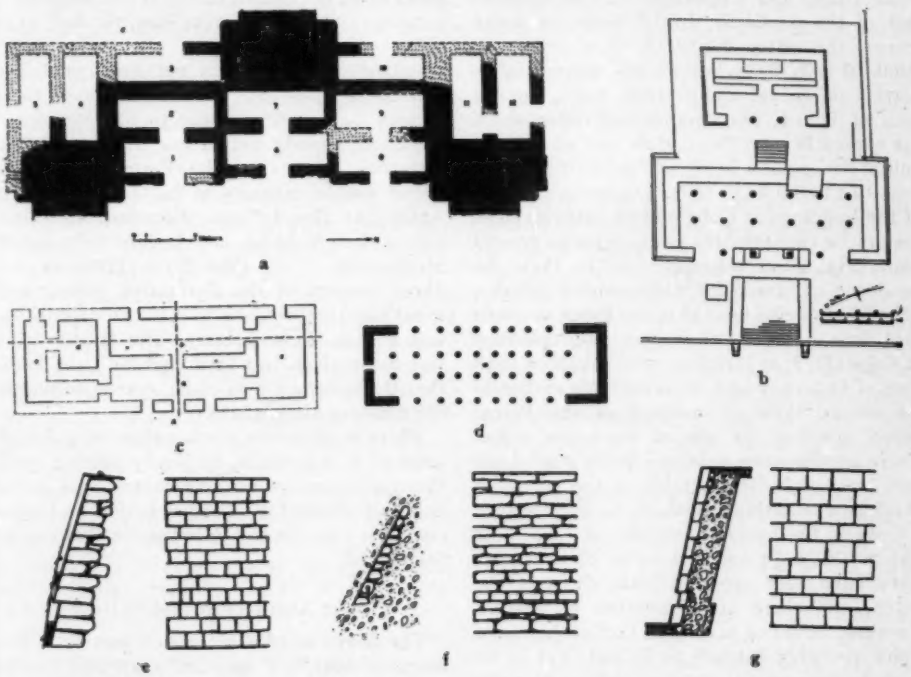


FIG. 2.—Ground plans and masonry details of Maya buildings of different architectural styles: *a*, Structure 1, Xpuhil, Rio Bec style (after Ruppert and Denison); *b*, Temple of Wall Panels, Chichen Itza, Mexican style (after Ruppert); *c*, Structure 38, Coba, early Peten style (after Thompson, Pollock and Charlot); *d*, Structure 9, Chacmool, Period of Mexican absorption (after Lothrop); *e–g*, masonry styles at Uaxactun (after Smith) left to right—block, intermediate, veneer. *a*, *b*, 1/500; *c*, 1/750; *d*, 1/1000.

Buildings in this style at Oxkintok are grouped around courts in a manner reminiscent of the city planning of the Peten. As in the Peten, there are also stelae associated with these buildings. Some of those at Oxkintok carried Initial Series; unfortunately, all are too weathered to be read. The pottery of the district includes sherds of the Formative period and material which seems to equate with the Tzakol phase, although the actual basal-

the pottery of the Usumacinta Valley this must remain a conjecture. This masonry style, which appears to have been rather widespread in the western part of the northern area, is evidence for intensive occupation there in the first half of the Initial Series period. The second architectural style at Oxkintok is Puuc, and this will be discussed below. Trenches near the building that housed the lintel to which we have referred have produced Puuc pottery above sherds of the style which appears to equate with Tzakol. Therefore, it is a fair assumption that

[5] Shook, 1940. For masonry types, see Smith, 1937.

the early style of masonry, the pottery which appears to equate with Tzakol, and the dated lintel are part of the same complex. This complex can be dated approximately at 400–650 A.D.

From the important site of Acanceh comes fuller evidence that Puuc architecture was built above early Peten.[6]

At Tulum and Ichpaatun, on the opposite side of the peninsula, Initial Series on stelae record the dates 9.6.10.0.0 (A.D. 564) and 9.8.0.0.0 (A.D. 593), but we are without information on coeval architecture. Coba, not far west of Tulum, has a number of stelae which are carved in pure Peten style and which bear Initial Series dates between 9.9.0.0.0 (A.D. 613) and 9.12.10.0.0 (A.D. 682). Furthermore, most of the buildings at Coba and its satellite cities are precise counterparts, in assemblage, ground plan (Fig. 2, *c*) masonry, and in their dependence on stucco for decoration of facades, of buildings being erected in the Peten at about that time or shortly thereafter.[7] The masonry of Coba (Pl. I, *a*) is rather more advanced than that of Oxkintok and is comparable rather to the second style of masonry of the Peten, which involves the use of brick-like stone. There are also some buildings in the much later east coast style, attributable to the period of Mexican absorption, to which we shall return.

Coba is the hub of a number of causeways which radiate to outlying ruins. Short causeways have been reported from cities in the Peten, and there are a number in western Yucatan, including several at Oxkintok, one of which probably extends to Uxmal. Yet in no case are these so elaborate, so well-made, or so numerous as those around Coba. Up to the present, sixteen have been discovered there, and more almost certainly exist. It is worth noting that the "megalithic" style of the masonry rather indicates that they were associated with the Initial Series period. This attribution is somewhat confirmed by the fact that the other groups of ruins with which causeways are connected appear, with one exception, to be composed of buildings only of the earlier style of masonry. Furthermore, small stones bearing short hieroglyphic inscriptions are set along the chief road, and these presumably belong to the same period, although the dates are not legible.

[6] Carnegie Institution of Washington Annual Report for 1942. Under Andrews.

[7] Thompson, Pollock, and Charlot, 1932.

Pottery from earlier levels at Coba resembles to a fairly marked degree ceramic material of the Initial Series period found in British Honduras and, to a slightly less extent, that found in the Peten.

The one site connected with Coba by causeway which differs in style of architecture and in other respects is Yaxuna. Lying about ten miles south of Chichen Itza, it is the terminus of a causeway sixty-two miles long, the longest of those radiating from Coba.

Although nothing has yet been published concerning the masonry of Yaxuna, three architectural styles appear to be represented there. As already noted, one huge pyramidal structure belongs to the Formative period. Other visible masonry is in the Peten style which has already been discussed. However, one vaulted building, now largely collapsed, is attributable to the Puuc style. Trenches produced pottery of the Formative period, material like that of Coba with Peten affiliations, and a little Puuc pottery. The stratification was not perfect, but there can be little doubt that the sequence is as given, corresponding to the masonry and architecture.

There is, therefore, ample evidence, although some of it is indirect, to justify placing early Peten architecture of the northern area in the first half of the Initial Series period and associating it with the few dated stelae that can be deciphered.

Puuc Architecture and Pottery

The Maya word *puuc*, which means "a low range of hills," is specifically applied to the hilly country in southwestern Yucatan. In that region are many Maya sites, most important of which are Uxmal, Kabah, Sayil, Oxkintok, Chakmultun, and Labna. This area produced a remarkably homogeneous style of architecture, characterized by the use of veneer masonry, boot-shaped vault stones, decorated cornices, round columns in doorways, engaged columns, and the execution in a stone mosaic technique of masks, serpent motifs, frets, and lattice work as facade decoration (Pls. I, *d*, *e*; III, *d*). Veneer masonry consists of thin slabs of stone used as a coating for the concrete core of a building (Fig. 2, *g*) as contrasted with a facing of deeply-tenoned stones, typical of the early Peten style. Veneer masonry, which Smith calls Masonry Style 3, appears in the Peten toward the close of the Initial Series period; in the

northern area it may have been adopted somewhat earlier. Stone mosaic as facade decoration is a departure from the stucco decoration of the earlier period.

Puuc sites are extremely imposing. Buildings are large and are usually detached sufficiently from one another to stand forth prominently. The Peten system of assemblage around courts, such as is found at Coba, does not occur in this region except in association with earlier buildings, like those of the first period at Oxkintok. Instead, the buildings are scattered in a rather haphazard fashion, except that at some Puuc sites there is a north-south causeway with important buildings or groups of buildings at each end. Pollock notes that certain variations in Puuc style occur in the southwest area (Holactum region). To avoid greater complexity, these variations are ignored in this paper.

One of the finest Puuc buildings is the so-called Nunnery at Uxmal, which, according to tradition, was occupied by daughters of the nobility, who spent some time prior to marriage in special establishments where they received an education and at the same time performed certain services in the temples. Actually, there are not the slightest grounds for ascribing such a function to the structure; indeed, it is extremely unlikely that these stone buildings were ever permanently inhabited. The Nunnery is built around the four sides of an open court which stands on a raised platform roughly a hundred yards square (Pl. III, *d*).

One ascends a flight of steps on the south side and enters the quadrangle through a very fine corbeled archway set in the middle of the south building. The four detached buildings have a total of eighty-eight rooms, many of which are very wide. In fact they include some of the widest rooms spanned by a single corbeled vault yet found in the Maya area—slightly over fourteen feet. On the north side there are only six rooms on the ground floor, but a magnificent range of twenty-eight rooms stands on a solid platform behind these, so that its floors are level with the roofs of the rooms in front.

The elaborate mosaic decoration of the upper facades was achieved by fitting together stones, each of which was carved as a small piece of the pattern. Monotony is avoided by diversification of pattern. One wing has a scheme of snakes with perfectly rigid bar-like bodies superimposed horizontally in ascending or descending order of length on lattice work. Elsewhere are masks and frets, around which twine rattlesnakes. Their heads and tails are decorated with plumage and their suppleness contrasts pleasingly with the rigid, geometrically arranged snakes (Pl. I, *d*). Statues in the round, pairs of monkeys placed back to back, and little models of huts are other elements which enter into the composition. Because of the spaciousness of the quadrangle, this diversity of motifs is not confusing; all blend into a magnificent whole. Furthermore, the architects of Uxmal, like those of most—though not all—Maya cities, wisely decorated only the upper half of the facade; the lower part, below the medial cornice, was quite plain and was faced with beautifully fitted stone veneer. Thus the decorated panels were framed by sky above and at the sides and by the undecorated lower facade beneath.

In two rooms, single capstones have been painted. This must have been love's labor lost. It would have been next to impossible to make out the quite miniature design because the capstone was over twenty feet above the floor and there was no direct lighting. The only light in these rooms entered through a single, rather narrow, doorway. Even at the present time, with doorways enlarged by the collapse of wooden lintels that once spanned them, it is difficult to see these little paintings. One of the capstones bears a date which appears to be 10.3.17.12.1 (A.D. 905). Although this reading is open to question, the style of the glyphs indicates that the date of the painting can not be much later.

A number of carved stelae have been found at Uxmal, but none has an Initial Series, and almost all the glyphs are eroded or of unknown meaning. Personages are portrayed in a style which is definitely not that of the central area and which is of little value at present in dating the inscriptions.[8] Stelae are rare in the Puuc, except at Uxmal, Sayil, and Oxkintok. In the last-named site they appear to be associated with the supposedly earlier Peten-like architecture. In fact, sculpture in low relief is rather uncommon in this region and is largely confined to occasional carved door jambs and a few stelae. In its place one finds a very strong de-

[8] Blom, 1932, summarizes and illustrates stelae, capstones, and architecture at Uxmal. For discussion of Puuc architecture, see sections by Pollock in Carnegie Institution of Washington Annual Reports for 1931–1932, 1935–1937, 1940. Pollock also discusses Chenes architecture. Shook, 1940, contrasts early Peten and Puuc styles.

velopment of facade decoration of mosaic type and a certain use of statuary in the round, tenoned into the facades.

Etzna, a site of considerable size in Campeche, southwest of the Puuc, has an important group of stelae, the decipherable dates falling within the Initial Series period. There is only one standing structure here, a temple classifiable as of Puuc style with a lofty, flying facade.

Gateways with corbeled vaulting are an interesting feature of Puuc architecture. They have been reported from Labna, Kabah, and Oxkintok, in the Puuc area, and one formerly existed at Chichen Itza. Their purpose must have been purely ornamental or ritualistic, for functionally they are about as useful as Constantine's arch or the Arc de Triomphe.

One of the strangest buildings in the Puuc area is at Kabah. The whole of the facade, above and below the medial cornice, is covered with serried ranks of masks of the celestial dragon. It is interesting but far from graceful. The architect's motto was clearly "nothing succeeds like excess." The effect is a trifle like that occasionally produced by grocery clerks who erect huge pyramids of salmon cans in a shop window.

Pottery that can be associated with Puuc architecture is of local types; few connections in form with the central area are observable, and there is a great scarcity of trade pieces to demonstrate connections, with the Peten. Most typical of Puuc pottery is the great abundance of slate ware and the rarity, perhaps absence, of local polychrome. Imported fine orange pottery is fairly common, but it is of Brainerd's Type Z, different in forms and decoration from the Type X which occurs in the Mexican period at Chichen Itza.[9] There is little doubt that it is earlier than Type X. Plumbate is absent. The lack of fine orange of Type X and of effigy plumbate would indicate that the Puuc sites were abandoned prior to the Mexican period. One plumbate sherd and two of Type X fine orange at Uxmal, taken in conjunction with certain Mexican influences in decorative motifs on some facades, suggest a slightly later abandonment of that site. Since Puuc architecture overlies early Peten style at some sites, and since the latter is already dated, the outside limits for the Puuc period would be approximately 9.10.0.0.0 (A.D. 633) to 10.8.0.0.0 (A.D. 987). I think the closing date is somewhat too late and would be inclined to place it some eighty years earlier, to make it conform with the abandonment of Chichen Itza and of the many sites of the central area.

Still stronger proof that the Puuc style flourished in the second half of the Initial Series period lies in the discovery of an Initial Series recording the date 9.15.12.6.9 (A.D. 743) carved on stones set in the wall of a room at Holactun, also called Xkalumkin. Geographically, this site lies outside the Puuc, but the architecture of the site as a whole, and of this building in particular, is very close to the Puuc style. Another date, but one that is a little open to question, is carved on the snout of a mask set in a Puuc facade at Labna. It almost certainly records 10.1.13.0.0 (A.D. 862). The capstone date from Uxmal has already been cited.

The dating of Puuc architecture is of some importance because for many years it has been assigned a much later date as a Maya renaissance. It is now amply clear that this style does not represent a renaissance of Maya culture but is contemporaneous with the great buildings of the central area which flourished in the classical age.

It is not known why these Puuc sites were abandoned at about the same time as, or very shortly after, the great ceremonial centers of the central area ceased to function. It is possible that whatever caused the abandonment of the one was also responsible for the desertion of the other; difficulties with the water supply may also have had something to do with the evacuation of the Puuc sites. Cenotes, or sinkholes, on which most of Yucatan depends for its water, are quite rare in the Puuc. Some wells were dug and reservoirs evidently existed, but several spells of severe drought may have brought about the decision to abandon the sites. As illustrative of the extreme conservatism of the Maya farmer, it is interesting to note that the present-day Maya in the region to the north still claim land rights in the Puuc and each year travel long distances back to their ancestral lands to plant their corn crops.

Maya Style of Chichen

The third architectural style attributable to the Initial Series period occurs at Chichen Itza. It is named "Maya style of Chichen" because it differs very markedly from the architecture of the Mexican period. It resembles that of the Puuc in all essentials, although there are minor

[9] Brainerd, 1941.

differences which set the two styles apart. For instance, such Puuc features as a triple entrance, engaged columns, stone models of huts, decoration on the medial cornice, and snakes shown in profile are unknown or very rare at Chichen Itza in this period. Furthermore, only one building of the Maya style at Chichen has veneer masonry (Pl. I, *c*); exteriors of all the rest are of block masonry (Pl. II, *b*), indicating a certain relationship to Masonry Style 2 of the Peten (Fig. 2). Veneer masonry, on the other hand, is typical of Puuc-style buildings.

That Maya style at Chichen Itza was in vogue during the Initial Series period is indicated by the fact that stone lintels with hieroglyphic inscriptions were used only with this type of architecture. One of these lintels, although reused in a much later building, has an Initial Series recording 10.2.9.1.9 (A.D. 878), and all the others are very probably of about the same date. This, however, is a matter of interpreting glyphs, for dates are presented in a manner different from that in the central area. A few years ago I proposed a new method of reading these glyphs which, if correct, places them as securely as if they were Initial Series, but the data on hand are insufficient to supply complete proof of the correctness of the method. However, they have produced some fine archaeological fence-sitting.[10]

The redecoration of Maya-style buildings with ornaments of the Mexican period, the reuse in structures of Mexican style of decorated elements removed from abandoned or collapsed buildings in Maya style, and the addition of wings in Mexican fashion to Maya-style buildings supply overwhelming proof that the Mexican style, already attributed to the Itza, is the later of the two. Since the Mexican period started about A.D 987. (10.8.0.0.0), most if not all of the structures in Maya style must be earlier than the close of the Initial Series period.

Maya-style buildings, like those of the Puuc, are scattered hither and yon without any definite plan of assemblage. All have corbeled vaults, and as a rule only the upper zone of the facade is decorated. None stands on a high pyramid, but all are set on low platforms.

The largest building in this style at Chichen Itza is the Monjas, the so-called Nunnery, another abode for virgins invented by early Spaniards whose interest in the preservation of chastity among the Indians was purely from the standpoint of tradition. The Nunnery at Chichen bears no resemblance to its namesake at Uxmal. Instead, it is a three-story building with much evidence of continual alterations and accretions (Pl. I, *b*). The center consists of a large and rather high platform, facing north, the rear of which supports the second story. Before its final form was achieved, an L-shaped wing was added on the east side. This has nine rooms the central two of which were filled with rock, presumably to bear the weight of a second story which however, was never built over the wing.

The facades of the wing are decorated with grotesque masks of the ubiquitous celestial dragon; the east end has a very elaborate scheme of decoration, its whole front representing a full-face view of the head of one of these monsters, with the doorway in the center forming the monster's mouth. This treatment, to anticipate, indicates influences from the Chenes, the fifth architectural style of the Initial Series period. There is a similar, but more elaborate, treatment on the Temple of the Dwarf at Uxmal.[11] Doorways of the front and side rooms of the second story of the Monjas are bridged with stone lintels which carry hieroglyphic texts. They record the date 8 Manik 15 Uo, which almost certainly corresponds to 10.2.10.11.17 (A.D. 880). The third story consists of a single room, now badly collapsed. Its lateness is attested by the many decorated stones haphazardly reused in its walls.

During the Itza occupation, two buildings in Mexican style were added at the southeast side of the building, thereby forming, with the L-shaped east wing, a small enclosed quadrangle. This is one of the pieces of evidence for placing the Mexican period after the Maya style.

Two or three structures of the Maya style at Chichen Itza and some Puuc buildings had what is termed a flying facade. This resembles a roof comb, in that it increases the height of the building and offers more space for ornamentation, however, the architect continued the facade upward above the level of the roof instead of placing a wall along the central axis of the roof to form the comb. One wonders

[10] J. E. S. Thompson, 1937. For discussion, see Beyer, 1941; Satterthwaite, 1942.

[11] This facade treatment, however, also occurs at Copan (Trik, 1939). It is therefore, possible that the Chichen Itza example is not directly attributable to Chenes inspiration, but is an example of a widespread trait. See J. E. S. Thompson, 1943*d*.

whether this feature could have led to naming one building at Chichen which displays it the Iglesia (church), since many colonial churches have flying facades on their west fronts.

The palace structure called the Akab Tzib (writing in the dark) is so named because a stone lintel with a sculptural scene and hieroglyphs span one of the inner doorways. Since the design can hardly be seen in the semi-obscurity, and since the lintels of the outer doorways are plain, it is very probable that this lintel was removed from some abandoned building for re-use here. The Akab Tzib has that rare feature in Yucatecan architecture, a perfectly plain facade. Its severity is a pleasant relief from the over-ornate, a kind of T-bone steak after a long surfeit of French cooking.

Every city sooner or later erects some atrocious building that turns the stomach: London has its Albert Hall; New York, its Grant's Tomb; and Harvard, its Memorial Hall. If one can free oneself of the enchantment which antiquity is likely to induce and contemplate this building in all its horror from a strictly esthetic point of view, one will find that none of these is quite so hideous as the Caracol at Chichen Itza (Pl. II, *c*). It stands like a two-decker wedding cake on the square carton in which it came. Something was pretty clearly wrong with the taste of the architects who built it. The Maya, however, may not be entirely to blame, since round temples were demanded by a certain religious cult, probably of Huaxtec origin, the introduction of which into Yucatan confronted the Maya with new problems of architecture. A later round temple at Chichen with a roof which was probably pointed and made of straw shows that with practice the Maya could improve, for the remains show that the lines were much more harmonious.[12]

The Caracol—the name means "Shell"—is so named because in its center is a spiral staircase by which one ascends to a small, square, upper room, now in bad condition. It has been claimed that this room served as an observatory, but the evidence is far from convincing. It is fairly certain that the present building was erected very shortly after the close of the Initial Series period, but masonry and decoration of the facade are in Maya style. During the Mexican period, numerous small structures were built against the platform on which it stands, and the stairway and the Caracol itself were redecorated by the addition of typically Mexican ornaments. Even these fail to hide its obvious purpose—to illustrate the proverb that you can't fit a round peg in a square hole.

In contrast to the ugly Caracol, the Temple of the Three Lintels, another building of Maya style, is a gem (Pl. I, *c*). Its proportions are excellent, and the unobtrusive treatment of the decoration on the upper zone of the facade is perfect. The lower zone is plain, but above the medical cornice a grotesque mask of the celestial dragon is set at each corner. These are joined by bands of lattice-work interrupted at regular intervals by groups of four columns. There are some reasons for believing that the lattice-work represents the scales on the half-snake, half-crocodile bodies of the celestial monsters, and the masks at each corner accordingly represent the heads attached to these bodies. This is the only building of Maya type at Chichen Itza which has a thin veneer facing.

At the present time it is not possible to give any picture of the pottery equatable with the Maya style at Chichen Itza. The long interval between the collecting of this material and its examination by Brainerd has had serious results. Roaches found the sack labels highly delectable, and the many times the sherd material had been moved and examined did not improve matters. Furthermore, much of the excavation at Chichen Itza was done at a time when architectural interests were paramount, and efforts to date constructions in terms of ceramics were not as thorough as they might have been. Mingling of deposits through constant rebuilding did not help matters. Doubtlessly Brainerd will be able eventually to identify the ceramic types of this period. Meanwhile, one can assume that plumbate ware and Type X fine orange were unknown.

Rio Bec Style

The fourth architectural style of the Initial Series period in the northern area, Rio Bec, derives its name from one of the sites where it was first observed. The evidence for attributing this style to the period in question is purely indirect. There are stelae at Rio Bec with Initial Series dates, but, unfortunately, they are too weathered to yield any sure dates. There is also a possibility that they represent a period anterior to that of the Rio Bec style. Nevertheless, Rio Bec architecture is stylistically rather close to that of Chenes, which falls in the Initial

[12] Ruppert, 1935; Pollock, 1936.

Series period. Furthermore, slight influences from Rio Bec are discernible in some buildings of the Initial Series period in the northwest corner of the central area—as, for instance, in the tower-like structures at the site of La Hondradez.[13]

The thin veneer masonry of Rio Bec style is without question the finest in the Maya area. Exteriors are faced with large stone slabs so carefully fitted that mortar was generally unnecessary in the joints or to even the courses (Pl. II, *a*). There is a stronger tendency to break joints than is usual in Maya building. Stones are usually a trifle under two feet long and about twenty inches high, with rounded backs. Where the veneer has peeled off, the hollow impressions of the stones leave a strange pattern.

The most interesting feature of the Rio Bec style is the use of masonry towers which apparently served no useful purpose, although they have a highly decorative value. They may be built on the roof, placed at the front corners, or set in the center, back or front. They resemble and are probably meant to be miniature reproductions of pyramids on top of which are perched temples, complete with roof combs (Pl. III, *e*; Fig. 2, *a*). However, the whole tower, including the temple-like upper part, is solid, and the steps which ascend the front are so steep (treads 4½ inches wide, risers 10½ inches high) that it is nearly impossible to climb them. Yet as pure decoration they dwarf the main building and distract attention from it. Small openings, like ventilator shafts, which traverse the towers horizontally from front to back may be clues to the use for which the towers were intended, but, if so, it is hard to see to what they point.

In contrast to its treatment in the Puuc and Maya Chichen styles the zone below the medial cornice is usually decorated and the upper zone is left plain. Lattice-work, masks, engaged columns, steps and frets, and squat crosses predominate. Not infrequently the main doorway is made to represent the mouth of a monster, with eyes and nose in mosaic technique above, and ears, with their involved ornaments, to the sides. These last, instead of being in the same plane as the rest of the facade, frequently jut forward, stressing the facial character of the decoration. The same trick was used at Nakum, a Peten site, on a building which is dated from the close of the Initial Series period by veneer masonry. This cross-tie strengthens the suggested dating of Rio Bec architecture. The style is found in the southeast corner of the northern area, where it dovetails into typical sites of the central area. Its extension to the north is not very well known, since this is a thickly forested country without any permanent inhabitants. No ceramic types have as yet been associated with it.

[13] Ruppert and Denison, 1943. Merwin's important paper on Rio Bec and neighboring sites, written in 1913, still awaits publication.

Chenes Style

Chenes, the fifth architectural style of the Initial Series period, is named for a geographical area in north-central Campeche in which water is obtained, not from cenotes, but from wells (in Maya, *chen*). As noted, the style is close to that of Rio Bec; future exploration may show that the two areas are contiguous, but at present the region between is archaeologically unknown. There is a strong development of the facade in the form of the mouth of a celestial dragon. Practically no undecorated areas are to be found on the front of most Chenes buildings; the whole surface is a confused mass of involved detail in which the motifs are entirely lost (Pl. III, *a*). It is nearest to Movie House de luxe style.

Stelae with Initial Series dates near 9.16.0.0.0 (A.D. 751) are found at Santa Rosa Xlabpak, a typical Chenes site, and appear to be coeval with this architecture. Furthermore, the Chenes conversion of the facade into the mouth of a celestial monster occurs at Uxmal, a Puuc city, and, as we have seen, in a rather modified form on the east wing of the Monjas at Chichen Itza. As it has been shown that these two styles are coeval with the Initial Series period, this tie helps to place Chenes style in the same horizon. There are other indications of Chenes influences in Puuc buildings at Uxmal, confirming the contemporaneity of the two styles.

At Santa Rosa Xlabpak there is an imposing three-story building with a total of forty-two rooms and two interior staircases. On the edge of the terrace in front of the central room of the third story is a very unusual feature, a decorated wall thirty-one feet long and twenty-three feet high, in the center of which is a corbeled doorway reminiscent of ceremonial gateways at Labna and other sites. It probably served, like a roof comb or a flying facade, to

give an appearance of greater height, since the third-story is too far back on the terrace to be visible from the base of the stairway.

Two interesting sculptures in low relief are set in the walls of two ground-floor rooms. The sculptural style is definitely of the Initial Series period, and rather early at that, but the panels have clearly been reset in their present positions. A section has been sawn off one side of one; in the other, stones have been transposed.[14]

Chenes is a restless, over-ornate style. Most buildings acquire added beauty when they start to fall, but Chenes temples do not grow old gracefully. All look tawdry, with more than a touch of the decayed prostitute about them.

Apart from architecture, little is known of the archaeology of the northern area during the Initial Series period. Because of the lack of excavation, there is no information about burials, and precious little about stone implements or trade. Some details of pottery have been given, but a fuller account of the ceramic history of the area must await publication of Brainerd's study. However, the outstanding feature of the pottery of the northern area throughout its history is the rarity of polychrome vessels. Almost all polychrome pottery found in these sites appears to have been imported from the central area.

There seems little doubt that the builders of these sub-cultures were in the main descendants of people who had inhabited the region since the Formative period or earlier. The rather lengthy discussions of the five architectural styles of the Initial Series period have tended to emphasize differences. Much more important than minor architectural differences is the uniformity in major matters. The general principles of architecture, decorative motifs, sculpture, and hieroglyphic texts are first and last Maya. Local divergences are of interest to the archaeologist, but culturally they are of minor import.

Migrations into Yucatan during the Initial Series period probably occurred, but I think general resemblances to the culture of the central area are due primarily to diffusion of ideas, not to actual migrations. Hierarchic traits introduced from outside overlie lay traits, such as local forms of pottery. The process, as I have pointed out elsewhere, is comparable in many ways to the spread of Islam. Uniformity in religion, sacred architecture, and writing disguise local differences in lay traits.

In sculpture and ceramics the northern area was definitely behind the central area during the Initial Series period. In the north, hieroglyphic writing never reached the development it did in cities of the central area. Yet in architecture, the northern area was probably ahead. It is hard to reach a definite decision on that point, because it is difficult to visualize the decoration of many buildings of the central area before the stucco elements fell. The best buildings of the northern area are a shade better than the best of the central area, but their worst are in a grievous taste to which, I like to believe, the central area never descended.

THE MEXICAN PERIOD

About the close of the tenth century, large movements of population were taking place in Middle America. The great Toltec center at Tula, Hidalgo, in central Mexico, was torn by war; according to tradition, a large faction of the population migrated southward under the leadership of Quetzalcouatl. It is probable that as a result of this migration peoples living around the mouth of the Usumacinta River and westward along the coast of Tabasco were profoundly influenced in culture and religion.

One group thus influenced was the Itza, who occupied Chichen Itza in a katun 4 Ahau, almost certainly 10.8.0.0.0 (A.D. 987). Their arrival ushered in the Mexican period. The story of the arrival of the Itza is recorded in the various books of Chilam Balam. The accounts are confused, but the invaders were said to have come from Tulapan (a Mexican name meaning "at Tula" or perhaps "the water of Tula"), and this is in agreement with archaeological evidence. However, this must not be taken to mean that the Itza actually came from Tula, but that, like most ruling families in Middle America who had come under Toltec influence, they claimed descent from the rulers of that city. The Itza may have been Nahautl-speaking Mexicans, but it is rather more likely that they were a Mexicanized Maya group, perhaps Chontals. Tradition relates that they were under the leadership of a man called Kukulcan. His name, which means "Quetzal-snake," is a literal translation into Maya of Quetzalcouatl. This legendary leader can

[14] Maler, 1902, pp. 220-228. Maler, 1895, illustrates a number of Chenes structures. Xlabpak is also known as Xtampak.

hardly have been the Quetzalcouatl of Mexican history, but it is quite likely that the Itza leader took the name of the god whose religion he had embraced. It is also possible that the tradition may refer to the fact that the Itza were under the guidance of that deity.

The Quetzalcouatl cult is very imperfectly understood. Modern investigators have interpreted the quetzal-feathered serpent as a deity of almost everything under and including the sun. According to one authority he is the moon; another would see the east wind behind his symbolism. Others look on him as a deified culture hero, and more than once he has been identified as a wandering Norseman who managed to get from Vinland to central Mexico, and there set himself up as a civilizer and missionary. The important thing, so far as the Maya are concerned, is that among them his cult was confined to the small ruling class, either intentionally or perhaps because the peasants were too firmly attached to their old gods of the soil to accept a substitute. Thus it comes about that Kukulcan has long since been completely forgotten by the Maya, whereas the older and simpler gods of the soil still receive the prayers and offerings of countless Maya villagers. Many temples were decorated with the symbols of this god of the governing class, and therefore from an archaeological point of view he is extremely important.

The Itza were not popular with the Yucatec Maya. They are described as rogues, people who disobey their fathers and mothers—a very serious crime among the Maya, who consider filial obedience and respect for their elders of prime importance—stupid foreigners, avaricious, lewd, and introducers of idolatry. The last probably refers to the Kukulcan cult and possibly to the introduction of actual idols of wood and stone, since there are grounds for believing that the worship of actual images of their gods was not a Maya custom before the advent of Mexican ideas.

It is more than possible that Chichen Itza had ceased fully to function as a religious center when the Itza arrived. The same causes which led to the collapse of the central area at the end of the Initial Series period were possibly at work at Chichen Itza. One of the books of Chilam Balam states that Chichen Itza was abandoned in 869 A.D., which was the first year of the katun 1 Ahau, the last of the Initial Series period. The actual statement is: "1544 is . . . 675 years after the town of Chichen Itza was depopulated." Elsewhere we read that the remainder of the Itza were driven out of Chichen Itza in the third year of a katun 1 Ahau. This checks very neatly with the above, except that it looks as though the chronicler might have been a bit muddled here when he said that it was the Itza who were then driven out. If our reconstruction is correct, it was the predecessors of the Itza who were expelled. The devil can quote scripture for his own purpose, and Maya archaeologists can do the same with the confused traditions of the books of Chilam Balam. The reconstruction appears to fit the facts as now known, but once-cherished theories still have a habit of ending in the discard pile.

The Itza brought with them, or developed soon after their arrival, many novel ideas in architecture and decoration. Quite a number of these find very close parallels at Tula, Hidalgo, the old Toltec capital,[15] but others are clearly modifications of Maya methods already existing at Chichen Itza. These changes make buildings of the Mexican period easily distinguishable from those of the preceding Maya style. Among the entirely new ideas which are also found at Tula are:

1. Columns in doorways in the form of feathered serpents with heads placed horizontally on the ground and bodies rising vertically in the air to form the column. The examples at Chichen Itza have a horizontal offset at the start of the tail to support the wooden lintel of the doorway (Pls. II, *d;* III *c*).

2. Free use of feathered serpents as balustrades and for general ornament.

3. Lines of warriors or of prowling jaguars (Pl. III, *b*, *c*) sculptured in low relief and used to decorate fronts of altars or walls. Also sculptural scenes representing the Toltec military orders of jaguars and eagles.

4. A sloping apron at the base of exterior walls (Pls. II, *d;* III, *c*).

5. Atlantean figures. These are sculptures in the round in the form of men with upraised hands. They served as supports of altars and at a late date were used as columns in doorways.

6. A peculiar pendant worn by warriors. It is shaped like a highly conventionalized bird in flight. They also wear a bird flying downward, often on the front of the headdress.

7. Colonnades as adjuncts of buildings (Pl. II, *d;* Fig. 2, *b*).

[15] For excavations at Tula, see Acosta, 1940, 1943.

8. Statues in the form of persons reclining with knees drawn up and elbows resting on the ground. In the center of the stomach there is a hollow or flat space, presumably to receive deposits of offerings. They stand in front of the entrances of temples and are known as *chacmols*, a name given the first one discovered by Le Plongeon, its excavator, who mistakenly believed that it represented an individual of that name.

The Itza also introduced a number of adaptations of existing practices in Maya architecture. They retained the corbeled vault, but, instead of dividing their buildings into many rooms, the widths of which were governed by the constructional limitations of the vault, they replaced interior walls with round or square columns on which they strung wooden beams. These served to support the weight of the corbeled vaults. In many cases columns were used instead of front walls, producing long colonnades up to four vault spans deep. Above the wooden lintels, the facade, carried up a considerable distance to counterbalance the pull of the vault, continued to supply a fine decorative area. Much larger and lighter rooms resulted from this style of building. Instead of being made up of many small rooms, both gloomy and damp, interiors were large and airy; their lines of columns are, to a certain extent, reminiscent of the great mosque of Cordova. There is, however, a possibility that this was not merely an architectural development, but a reflection of a different use of buildings resulting from new religious practices. Actually, this new type of architecture was far weaker than the old. The side thrust of the wall of a corbeled vault was too much for a line of columns, and, in addition, wooden beams decayed. As a result, there is not a single building of this character which has not collapsed. This collapse began while the city was still occupied, as evidence of the hasty efforts of the Maya to shore up dangerous sections demonstrates (Pl. II, *d;* Fig. 2, *b*).

Buildings in the Maya style of Chichen Itza invariably have narrow doorways spanned by stone lintels, and the level of back rooms is usually raised somewhat above that of the front rooms. In Itza buildings, all doorways save a very few in unimportant positions are too wide to be spanned by stone lintels, and accordingly lintels of wood were used (Pl. III, *c*). Also, the floors of inner sanctuaries were flush with those of the outer rooms. Another change is to be seen in the evolution of the altar. During the Itza period, the rather simple benches, such as one finds in most Peten buildings, blossomed forth as indubitable altars. These were either formed of flat stone slabs supported by serried ranks of Atlantean figures or were of solid construction with their fronts and sides decorated with lines of elaborately garbed warriors carved in low relief and covered with stucco painted in several colors.[16]

An entirely new type of building introduced by the Itza is the skull platform. This is a rectangular platform, the sides of which are carved with lines and lines of skulls impaled on sticks. Quite small, square platforms similarly decorated with sculptured skulls are associated with buildings of the Aztec period in the Valley of Mexico, where they served as ceremonial tombs for the interment of the 52-year cycle. The fifty-two years were symbolized by stones carved to represent fifty-two canes tied together in a bundle. It is possible that the skull platform at Chichen Itza served a similar purpose.[17]

The Itza, according to traditions, did not confine their activities to Chichen Itza. Other groups, under the leadership of Kakupacal and Uilo, seized Izamal, Motul, and Mayapan. Kakupacal, who was deified at a later date, was said to have defended himself with a fiery shield and in that respect reminds one somewhat of Tezcatlipoca, an Aztec god who was the great rival of Quetzalcouatl and who carried a smoking mirror. Mayapan seems to have been of little importance at that time. There are a number of sculptured stelae at Mayapan which were almost certainly erected during the Initial Series period, but none carries Initial Series. They are probably to be associated with the scant remains of Puuc architecture found there. During the Itza occupation, Mayapan does not appear to have been architecturally in the first rank, although, as we shall see, it later rose to a position of domination. Izamal, on the other hand, appears to have been of very considerable importance during the Initial Series period.

At the time of the Itza domination at

[16] Typical Itza buildings are the Temple of the Warriors (Morris, Charlot, and Morris, 1931) and the Temple of the Wall Panels (Ruppert, 1931). See also Palacios, 1935, for general description of buildings at Chichen Itza. For comparative ground plans, see Marquina, 1928.

[17] Caso, 1940.

Chichen Itza, the country appears to have been divided into a number of independent chiefdoms. The book of Chilam Balam of Mani says that following the Itza occupation of Chichen Itza, a triple alliance was formed by the rulers of Chichen Itza and Mayapan and the Xius. As a result of this, there was a period of peace that lasted two hundred years (until middle of katun 8 Ahau—A.D. 1194) when it was terminated by the overthrow of the Itza at Chichen Itza, a state of affairs which some people interpret as resulting from an alliance of Uxmal with the other two centers. We have seen that there is fairly strong archaeological evidence that the great centers of the Puuc were abandoned soon after the close of the Initial Series period, but it should be observed that there are ceramic and architectural grounds for believing that Uxmal continued to flourish for some time after its sister cities had been deserted. The Xius were certainly the governing family at Uxmal at one time, but it does not seem probable that they resided there during the whole two hundred years of the triple alliance.

The Xius, like most of the ruling families of Yucatan, claimed descent from the old Toltec rulers. In fact, the name of Xiu is quite probably of Mexican origin, and there are frequent references to the Xius as not only foreigners but outsiders who had never become thoroughly identified with the Yucatec. Nevertheless, Mexican influence is not very marked in the architecture of Uxmal, perhaps because the city was abandoned before what one might describe as the saturation point in Mexican motifs had been reached. Yet Uxmal shows more Mexican influence than other Puuc sites.

The Mexican-inspired domination of much of Yucatan seems to have led to profound changes of a social and religious nature. The ceremonial centers appear to have become real urban centers where people actually resided and which, in some cases, were converted into defendable fortresses. That this was an innovation so far as the Maya were concerned is, I think, demonstrated by the fact that the Maya had no name for a defended city, and consequently most Maya languages and dialects incorporated the Mexican word *tenamitl* to describe them. Furthermore, the Yucatec also borrowed, presumably for the same reason, the Mexican name for the town structure where the civil and military administration was centered. Again, the Mexican-inspired invaders seem to have been responsible for a national division into a militaristic ruling group and a serf class, since Mexican words to describe these two classes were also borrowed by the Maya of Yucatan. Other linguistic borrowings from the same source included certain military terms, again attesting to the militaristic complexion of the Mexican period.[18] It is possible, however, that some cultural borrowings date from the subsequent period, when other groups of Mexicans or Mexicanized peoples came to Yucatan. Sculptures on Itza buildings at Chichen Itza testify to the strongly militaristic orientation of the Mexican period, and I think there can be little doubt that the priests were forced to yield much of their powers to the new rulers. Deities of Mexican origin, other than Quetzalcouatl, are also represented in sculptures of the Itza period. They include Tezcatlipoca, god of luck and a rival of Quetzalcouatl, and Tlalchitonatiuh, the sun god at sunrise, a deity closely connected with the religious rites of the military orders of Jaguars and Eagles.[19]

The two hundreds years of Itza domination at Chichen Itza were marked by the erection of a large number of buildings. These included the great ball court with its attached temples —there are at least nine ball courts at Chichen Itza, but only one of huge size— the Temple of the Warriors (Pl. II, *d*) with the Temple of the Chacmol below it and the various colonnades on its west and south sides, the Castillo and the building encased within it, the Temple of the High Priest's Grave, the Mercado (the so-called "market"), the Temple of the Wall Panels (Fig. 2, *b*), and others.

In the later stages of Itza domination at Chichen there seems to have been a slow Mayaizing of the conquerors. Probably a small group at the start, their Mexicanized culture gradually lost ground, and they were culturally absorbed by those whom they had conquered. The reason for this assumption is that sculptures in some of the latest buildings of the Mexican period represent Maya types once more.[20] Moreover, in the sixteenth century the Itza spoke only Yucatec, whereas on their arrival at Chichen Itza they had been stigmatized as foreigners who spoke only broken Yucatec. Their names also were Maya, but

[18] J. E. S. Thompson, 1943*a*.
[19] J. E. S. Thompson, 1942, 1943*b*.
[20] Ricketson, 1927.

they may always have been so if the Itza were merely Mexicanized Maya of Tabasco.

The Itza conquest of much of Yucatan appears to be commemorated by many sculptures at Chichen Itza. These are particularly well preserved in the lower room of the Temple of the Jaguars, where carvings in low relief cover the walls. These exploits are also presented in murals in the upper rooms of the same building. This structure stands partly on and partly at the base of one of the walls of the great ball court and undoubtedly was used for ceremonies in connection with ritualistic games held in the court.

The Itza warriors are easily recognized by their costume. They have a shield over the back of the left hip, carry spear-throwers and bundles of darts, and wear on their breasts or on the front of their headdresses the bird-like ornament seen on sculptures from Tula. Often the small bird face-downward, also a feature shared with Tula, replaces the last as an ornament on the front of the headdress. The Itza always wear leg bands and have small buttons of jade in the side of the nostril in contrast to the conquered Maya, who wear leggings and have long transverse jade rods piercing the septum of the nose. The latter never carry spear throwers but use in their place long-shafted spears with points of stone or barbed wood. Their shields are long and flexible or short and round. As a beaten people, the Maya are depicted as dejected, and by and large they are rather pathetic creatures. In some cases they have their right hands on their left shoulders, a sign of peace, but here the equivalent of our hands upraised in surrender.[21]

Gold disks dredged from the sacrificial cenote at Chichen Itza also depict the discomfiture of the Maya. In the center of one sits a Maya who looks as close to a sissy as anything in Middle American art. He is seated on the ground, apparently trying to pull out a spear which has been driven into his back. At each side of him stands an Itza warrior, as tough looking as a Hollywood top sergeant; one has a dart ready to hurl, and both are perfectly indifferent to the suffering Maya. It is very obvious that they consider themselves Herrenvolk.[22]

During the Mexican period, Middle America was knit together by a network of commercial routes. Metal, which had made its appearance in the interregnum following the close of the Initial Series period, became fairly common. There are no known deposits of metal or precious stones in the northern Maya area, and, accordingly, there can be no doubt that its inhabitants were entirely dependent on imports to satisfy the need for such materials. Many objects of copper and gold and an alloy of the two have been dredged from the sacred cenote at Chichen Itza, into which they had been cast as offerings to the rain gods. Their forms and designs indicate that most were not of local manufacture and that not a few were made in Costa Rica or Panama. However, a few pieces, such as the gold disks already described, are of local workmanship and presumably were made of metal obtained by melting imported trinkets.

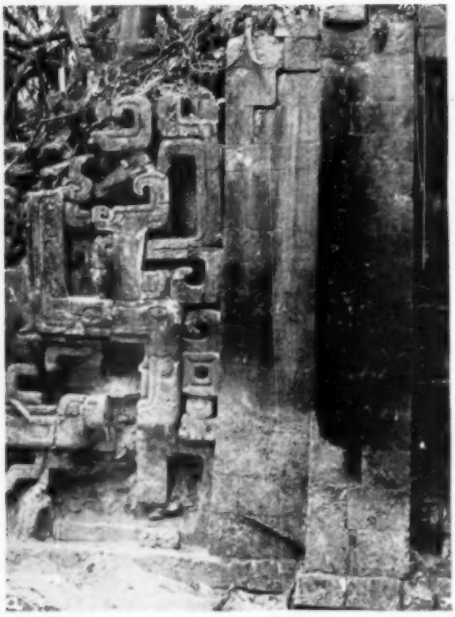
Turquoise, which is unknown in the Initial Series period, appears during the Mexican period. Itza warriors are depicted wearing collars of this much-prized material, and disks with mosaic designs in turquoise have been found as dedicatory offerings beneath Itza temples. Turquoise beads have also been found in a burial of this horizon. Beads of rock crystal and vessels of Mexican onyx are other novelties associated with this period. It has been suggested that the turquoise came from the turquoise mine near Santa Fe, New Mexico. However, it is not necessary to seek so far for a source, since there are strong indications in Aztec tribute lists that turquoise was mined in Veracruz. The vessels of onyx almost surely come from the same region or from the adjacent states of Oaxaca and Puebla. Most characteristic of the Mexican period are vessels of Plumbate ware, to which reference has already been made more than once, and fine orange ware (Brainerd's Type X). The latter is made of untempered clay and appears to have been imported from western Tabasco or southern Veracruz, since some of the forms are typical of the latter region, where much of the pottery appears to be untempered.

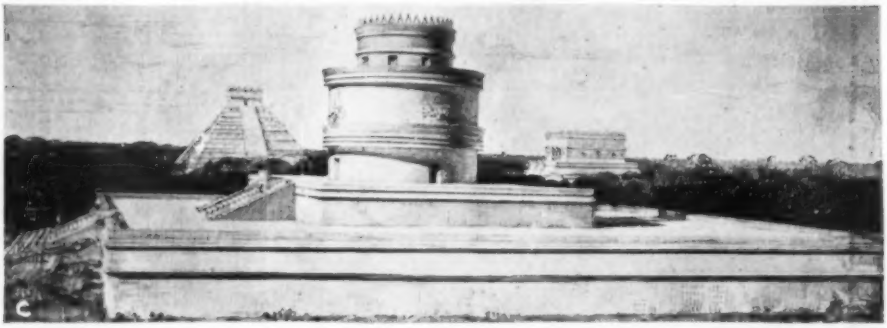
Figurines are quite scarce during the Mexican period at Chichen Itza, but they are not wholly unknown. Some fine examples occur at Jaina, a small island off the west coast, and some, but not all, of these are perhaps attributable to this horizon. The inventory of flint and obsidian implements does not appear to change to any marked degree, except that small points used perhaps with darts propelled by spear-

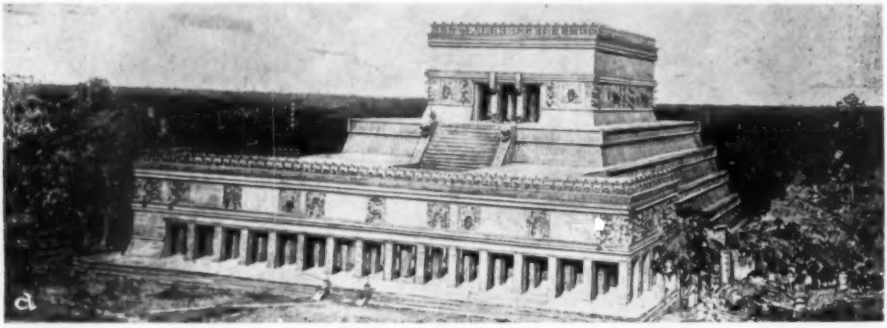
[21] Tozzer, 1930.
[22] Tozzer, 1930, Fig. 7.

[THOMPSON] PLATE I
AMERICAN ANTIQUITY, VOL. XI

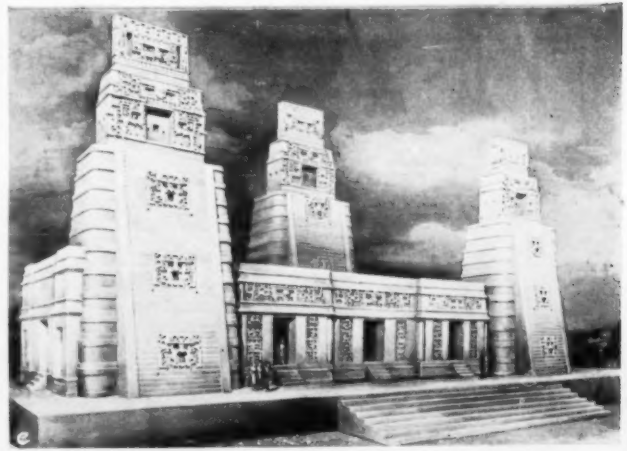
Architecture of the Initial Series period. *a*, masonry of Early Peten style, Coba; *b*, Monjas at Chichen Itza, Chichen Maya style; *c*, Temple of the Three Lintels at Chichen Itza, Chichen Maya style; *d*, facade decoration on the Monjas, Uxmal, Puuc style; *e*, part of palace, Sayil, Puuc style. (*a-c*, *e*, Courtesy of Carnegie Institution of Washington; *d*, Courtesy of Middle American Research Institute.)







Architecture of the Initial Series period: *a*, masonry of Rio Bec style at Las Escobas, Quintana Roo; *b*, side view of the Iglesia at Chichen Itza, Chichen Maya style. Restorations of buildings at Chichen Itza (after K. G. Conant); *c*, Caracol, without added buildings; *d*, Temple of the Warriors, without west and north colonnades. (Courtesy Carnegie Institution of Washington.)



Architectural and decorative details: *a*, temple facade at Hochob, Campeche, Chenes style; *b*, prowling jaguars, Pyramid B, Tula, Hidalgo; *c*, Temple of the Jaguars, Chichen Itza. Restorations of buildings of the Initial Series period (after Proskouriakoff); *d*, Monjas group at Uxmal with Temple of the Dwarf at right, Puuc style; *e*, Temple at Xpuhil, Quintana Roo, Rio Bec style. (*a*, after T. Maler; *b*, courtesy J. Acosta and Instituto Nacional de Antropología e Historia; *c–e*, courtesy of Carnegie Institution of Washington.)

Warriors sculptured on columns and faces in jaws of serpent birds. *a*, *c*, Tula, Hidalgo; *b*, *d*, Chichen Itza. (Courtesy Carnegie Institution of Washington.)

throwers were introduced. The spear-thrower itself was used to a limited extent by the Maya during the Initial Series period, but it does not appear to have become a common weapon. At least, it is never shown as a weapon of the Maya groups conquered by the Itza.

The custom of erecting dated stelae was not followed by the Itza, and it almost certainly lapsed everywhere shortly after the close of the Initial Series period. Itza sculpture, however, not infrequently shows name glyphs above individuals. This was a Mexican custom which did not exist among the Maya, so far as we can tell, except that prisoners are sometimes shown with glyphs inscribed on their bodies. The Maya presumably had name glyphs, but the art of the Initial Series period is so impersonal that there would have been little occasion to employ them.

Little is known of burial customs during the Mexican period. A deep vertical shaft, rectangular and lined with faced stone, which had been built in the core of the pyramid of the High Priest's Grave, leads from the floor of the temple to a wide cavern beneath the pyramid. In this shaft were seven graves one above the other. Unfortunately, there is practically no information as to how the bodies were disposed, but the dimensions of the shaft (roughly 3 feet by 2 feet 4 inches) precluded full-length burials. With the burials were pottery vessels, copper bells, and beads of jade, shell, and rock crystal.[23]

The sculptural art of the Itza departs radically from the classical Maya style of the Initial Series period, both in subject matter and in treatment. Instead of gods, or human impersonators of the gods in passive attitudes, and an almost complete suppression of the individual or mundane matters, characteristic of the Initial Series period, Itza art concentrates on lay subjects. The favorite subjects are processions of individuals dressed as warriors; religion, represented by the feathered serpent, is kept in the background as an adjunct of the state rather than as its focal point. This art clearly reveals a military organization in alliance with, but striving to control religion—a kind of predecessor of the Fascist-Vatican concordat, and perhaps no more successful in its ultimate aims.

The soft lines of idealized Maya beauty—the deformed foreheads, the aquiline noses, the drooping lower lips, and the receding chins—are replaced by undeformed heads, close-lipped features, and prominent chins—altogether a tougher physical type. It is not to be wondered at that the Itza carried all before them when they fought the softer Maya.

The episode of the fall of the Itza is one of the few in Maya history on which we have some detail, although it is far from enough to satisfy our curiosity, and in some respects the scant details contradict themselves. The leader of Chichen Itza at that time (A.D. 1194) was called Chac Xib Chac. This means "the Red God of Rain" and suggests not a personal name but a title. It is not improbable that his personal name was Ah Ulmil. The most romantic version of the cause of the war, and the one which, as a matter of fact, has most evidence in its favor, is that Ulil, the ruler of Izamal and, therefore, a fellow Itza, gave a banquet to celebrate his wedding. An unidentified person, who must, nevertheless, be Chac Xib Chac, ran off with Ulil's bride.

In the war which resulted from this abduction, Hunac Ceel, apparently the leader of Mayapan, turned against Chichen Itza and, with the aid of Mexican mercenaries, defeated Chac Xib Chac. For some obscure reason Hunac Ceel's conduct is universally described as treachery, but the various accounts of the incident give us no good clue to the nature of this treachery. In fact, there are many gaps in this New World theme from the Iliad. There are no sons piously aiding aged Priam, no faithful Achates, no Achilles sulking in his tent, and, worst of all, no description of this Maya Helen. Such absence of background would not worry Hollywood, but it is a trifle disconcerting to the historian. One regrets that the hero or villain was an Itza, and accordingly not surely a Maya. The art of the Maya is so consistently prim that it would be a relief to be sure that one of that race did kick over the traces and in so doing introduce a little glamor into Maya history, for adultery has the peculiar quality of being attractive to some people in immediate prospect, and to all in vicarious retrospect.

Hunac Ceel is an elusive figure who flits across the stage in a mysterious way. Live characters are so few in Maya history that one profoundly regrets that more details of his life are not known. One doesn't demand a Lytton Strachey exposé, but at least enough to piece together the fragmentary incidents that have survived. He first appears on the scene in connection with sacrifice at the sacred cenote at

[23] E. H. Thompson, 1938.

Chichen Itza. It was a custom to cast persons into this sacred well as offerings to the rain gods. At dawn the victim was thrown from a small sanctuary on the south rim of the well. If he (or she) survived the sixty-foot plunge to the water and could keep alive till midday, he was hauled up again, as he was believed to have been sent back to this world with a message or prophecy from the rain gods. He delivered the message and was accorded high honor.

Hunac Ceel, who also bore the name Cauich, appears to have offered himself as a victim to be cast into the well after a number of persons had been thrown in, and none had survived to bring back the message. In the words of Roys' translation of the passage in the book of Chilam Balam of Chumayel, "It was Cauich, Hunac Ceel Cauich was the name of the man there who put out his head over the mouth of the well on the south side. Then he went to get it. Then he came forth to declare the prophecy." This can hardly be interpreted otherwise than as a statement that Ceel was a volunteer victim who survived to relate the much desired message. As Roys remarks, "He was evidently a man of the stuff of which rulers are made, a man with sufficient courage and force of character to shape his own destiny."[34]

After being drawn from the well and giving the message, Hunac Ceel was made head ruler, but, unfortunately, the story does not tell us of what chiefdom. In another book of Chilam Balam, he is said to have been ruler of Mayapan, but the cenote incident almost suggests that he was a Chichen Itzan. In that might lie the explanation of his treachery. Had he been a Chichen Itzan and risen to high rank, his action in throwing in his lot with Izamal against his native city might well be dubbed treachery.

As a result of the war, Chac Xib Chac was "trampled on" and "despoiled of his insignia." The Itza group left Chichen Itza and, moving far to the south, settled at Tayasal (a corruption of Ti-Ah Itza, "At the place of the Itza") on the shores of Lake Peten, in the southern part of the Peten District of Guatemala. Pottery shows that Tayasal had been occupied since the Formative period, but there is no surviving tradition of any occupation prior to the arrival there of the Itza at the close of the twelfth century. Because of its isolation, this Itza settlement endured long into Spanish colonial times. Cortes passed through Tayasal on his famous march to Honduras. It was not until 1697 that this last stronghold of Maya culture was subdued and its inhabitants were dispersed. Until the very end, Itza priests continued their sacrifices, including not a few captured Spanish soldiers, and consulted their hieroglyphic books. One regrets that no ethnologist was present to record those last years.

It is interesting to reflect that many of the thirteen colonies had struck strong roots before the last Maya citadel had fallen. The temple-topped pyramids of Maya tradition yet reared themselves heavily from the earth of the tropics at a time when graceful steeples were rising, with the yeast of Christopher Wren's inspiration, in a more temperate climate to the north. Maya priests were not a whit less austere than their fellow clericals in New England—and after all there is a bond between witch burning and human sacrifice, for both were performed for the supposed good of the community at the expense of the individual. If anything, the Maya position was a trifle more ethical, since witches were the victims of hysteria, whereas those sacrificed by the Maya died in an orderly manner to keep man's bargain with the gods.

PERIOD OF MEXICAN ABSORPTION

With the fall of Chichen Itza, the branch of the Itza established at Mayapan became dominant and succeeded in bringing the whole country under its rule. Presumably this was due largely to the efforts of Hunac Ceel and his Mexican mercenaries. The ruling family of Mayapan was called Cocom and claimed descent from Kukulcan, although all sources are agreed that this semilegendary personage was both virtuous and unmarried. However, before imputing unchastity to the god of a people who did not permit their deities the license of Mount Olympus, it is well to bear in mind that Kukulcan, like its Mexican equivalent Quetzalcouatl, may also have been the title borne by the holders of certain offices. (The supreme pontif of the Aztecs was always called Quetzalcouatl.) Some confirmation of this possibility is to be found in one passage which refers to Hunac Ceel as Ah Nacxit Kukulcan, Nacxit being one of the names of Kukulcan in his role as a god of merchants and travelers. This suggests that Hunac Ceel carried this title because of some position, presumably ecclesiastical, which he held.

[34] Roys, 1933, p. 175.

Mayapan's domination of the country lasted from shortly after the departure of the Itza from Chichen Itza in the middle of a katun 8 Ahau (A.D. 1194) until the next occurrence of a katun 8 Ahau, which ended in A.D. 1460. Under the Cocoms, the government was thoroughly centralized. Head chiefs of other districts were required to reside in Mayapan, whence they administered their territories through local deputies. Cocom power was upheld by the arms of Mexican mercenaries brought from Xicalango, on the Bahia de Terminos, which, during Aztec times, was the seat of an Aztec garrison and a great commercial entrepot.

Mayapan occupies an area of over two square miles and is surrounded by a wide wall six to seven feet high and over five miles long, pierced by nine entrances. Several flights of steps give access to a walking way behind the parapet on its summit. As already noted, Mayapan was occupied during the Mexican period. There is also some evidence for an occupation during the second half of the Initial Series period, for Brainerd has noted the presence of some Puuc pottery, and there is a certain amount of thin veneer stone scattered around which is probably attributable to Puuc influence. At Mayapan thin veneer is unknown during the Mexican Absorption period, so it may not have been used there in the Mexican period. The various carved stelae at the site probably belong with the Puuc occupation. One of them carries the date 4 Ahau, perhaps corresponding to 10.1.10.0.0 (A.D. 859).

Architecture of the period of Mexican Absorption is of poor quality and is reminiscent of that of contemporaneous buildings at Tulum and other sites in eastern Yucatan. Many of the structures are long edifices consisting of colonnades facing front and back, roofed with beams and mortar or with perishable materials. This is in contrast to the colonnades of Itza architecture with corbeled vaulting and solid rear walls. Masonry is miserable, a sad degeneration from the veneer work of the Mexican period at Chichen Itza. On the whole, buildings of this period look as if they had been and almost certainly were, no more solid than the structures hastily erected to house one of those expositions of progress for which the nineteenth and twentieth centuries have had a positive mania. The Maya did not literally whiten their sepulchers, but figuratively they came pretty close to it when they daubed these jerry-built affairs with mortar and plaster to produce a pleasing appearance of well-laid walls. Some buildings were made with corbeled arches. Mayapan boasted a round temple distressingly like the Caracol at Chichen Itza, but this has now collapsed, and it is not at present possible to place it in any particular period.

Although Chichen Itza had been abandoned by the Itza, it continued to be the goal of pilgrimages to the sacred cenote for the purpose of invoking the rain gods. Urban activities, however, continued on only a very small scale. To this post-Itza period, when all authority resided in Mayapan, are attributable crude, slovenly little buildings, improvised of column drums, sculptured blocks and cornice elements taken from buildings which themselves were late. These were scattered haphazard in the great Court of the Thousand Columns where, without much doubt, they would not have been permitted during the Itza regime. In one Itza colonnade, carved stones, torn from the altar and the facade, had been used to prop up the endangered fabric. Another building which may belong to the period of Mexican Absorption is the crude House of the Grinding Stones, which had a flat roof of beam and mortar construction. At least, the artifacts found scattered on the floors included a copper spear point, indicative of a very late occupation. That buildings were allowed to fall into decay at this time is amply demonstrated by the finding of an unbroken plumbate vessel which was almost certainly deposited in debris which had fallen from the Caracol. Plumbate vessels were not traded far and wide after the thirteenth century. If such an important building as the Caracol had started to fall by that time, and no effort was made to remove the debris, it is pretty clear that there was no active authority in the city.

At Tulum, situated on a cliff on the east coast of Yucatan, there are many buildings.[25] Some are of the Mexican period; others may be attributed without hesitation to the period of Mexican Absorption. On its land side, Tulum, like Mayapan, is surrounded by a wall. City walls are rare in the Maya area; I know of only two other sites where they occur. These are Chacchob, Yucatan, where in places the wall stands to a height of eighteen feet, and Ichpaatun, in southeast Quintana Roo. A stela with

[25] Lothrop, 1924.

an Initial Series shows that the latter site was occupied at an early date, but very late ceramics attest also to a late occupancy.[36]

Colonnade structures, reminiscent of those of Mayapan, are found at Tulum, and almost certainly were erected during the period of Mexican Absorption. In at least one building of this type, the roof was flat and composed of beams and mortar. The occurrence of this kind of roof is not in itself an indication of lateness, since, as has been noted, roofs of this type were being used even during the Initial Series period. On the other hand, this form of roof is late when in association with this type of colonnaded structure and rough masonry. At Chacmool, farther down the coast, there exists another open colonnaded building of late type with a flat roof supported by four rows of columns (Fig. 2, *d*). Only the ends of the building and the short lateral sections which project therefrom are solid wall. This almost surely belongs to the period of Mexican Absorption, although other buildings at this site and the presence of a chacmol statue point to an occupation during the Mexican period as well.

Tradition speaks of three or four brothers or relatives (more probably related groups under three or four different leaders) who came from Mexico. One group is the Itza who settled at Chichen Itza; another is probably the Itza, under the leadership of Kakupacal and Uilo, who seized Izamal and Mayapan: The third group might be the Xius who established themselves at Uxmal. The fourth group might be identified with a certain Zacalpuc, who founded towns on the northeast coast. Although this is hardly more than speculation, the architecture of east-coast towns has a strongly Mexican character which, so far as that region is concerned, rather bears out the tradition. More important is the fact that, unlike Chichen Itza, east-coast towns were intensively occupied during the period of Mexican absorption. Even Coba, which is predominantly in Peten style, has a number of buildings of this east-coast type, and perhaps all of these date from the period of Mexican Absorption.

Not much is known of the archaeology of this period aside from its architecture. Plumbate and fine orange wares may have survived into the opening years, but they soon disappeared. Other pottery was dull and uninteresting save for rather elaborate incense burners which appear to have served also as idols. Sculptured stone work is crude and rare. A number of years ago the decline of Maya culture was thought to have come immediately after the close of the Initial Series period, but I feel it is now becoming evident that the great retrocession in sculpture and architecture came after the fall of Chichen Itza. Sculpture of the Mexican period shows a marked decline from that of the Initial Series period, but a far greater falling off followed the Mexican period.

A word should be said as to why this period of central government is termed the period of Mexican Absorption. Were we dealing only with the history of Yucatan, a name such as "period of central government" would serve admirably. Period names, however, should apply to at least two of the three areas, and, unfortunately, we have no evidence of central government at any time in the central area, and only rather tenuous evidence for its existence in the southern area.

However, we know that in the centuries following the Mexican period, and probably for quite some time before its end, the tide of Mexican influences was ebbing both in the northern and southern areas. The Maya, like the Chinese, seem to have had an unlimited capacity for absorbing and naturalizing foreign influences and foreign invaders.

The new ideas, the new religious concepts, and the new social organization introduced by the Itza were gradually made to conform to the Maya pattern of life. For instance, the great military orders of Eagles and Jaguars,—Toltec orders of knighthood—had been brought by the Itza.[37] The importance of the cult is attested by numerous carvings on buildings of the Mexican period at Chichen Itza which depict members of the orders offering what probably represented human hearts to Tlalchitonatiuh, the Mexican god of the rising sun. Yet sources at the time of the Spanish conquest make no mention of these orders in Yucatan, and it is highly probable that they had disappeared or, at least, lost much of their importance. Similarly, the worship of such Mexican deities as Tezcatlipoca and Tlalchitonatiuh, who had been prominent during the Mexican period, had entirely ceased at the time of the Spanish conquest, and there

[36] Gann, 1926, pp. 48–54: Noguera, 1940.

[37] At Tula there are sculptures in low relief which undoubtedly depict ceremonies of the orders of Jaguars and Eagles.

is little doubt that even the cult of Quetzalcouatl was approaching extinction at that time. Probably, too, there was a resurgence of theocratic power during the period of Mexican Absorption. Foreign speech disappeared, and the leading families became to all intents and purposes Maya, although still claiming Mexican descent.

These are a few of the manifestations of that slow process of absorption, in which Mexican cultural elements were made over or cast out, and Maya culture reasserted itself. The same process was at work in the southern area at approximately the same time.

Passages in the books of Chilam Balam reveal how distasteful the Mexican intrusion was to the Maya, not so much because of the act of conquest, but because of the changes in the Maya attitude to life which it sought to impose. On the orderly, moderate, and, I am sure, essentially introvert culture of the Maya, with theocratic organization, had been grafted an alien philosophy. Violence, excess, and absence of orderly conduct are given by the Maya scribes as the most abhorrent features of the new order. The Maya had a profound antipathy for this militaristic and extrovert culture. In the end they vanquished these new ideas by absorbing the class that had introduced them.

During this period the bow and arrow first came into general use in Yucatan. It is said to have been introduced by Mexican mercenaries employed by the Cocoms. This superior weapon is undoubtedly a very recent introduction throughout Middle America. It is nowhere shown in Maya or Itza sculpture or fresco, not even in nonreligious subjects such as the battle scenes depicting the Itza conquests. As is well known, religious art tends to portray only the weapons sanctified by long usage, just as the tomb of a twentieth-century warrior in a church will show him holding a sword not a tommy gun. This conservatism would hardly extend to the very realistic murals of the Itza conquest; one must therefore conclude that the tradition that the bow and arrow were introduced at the fall of Chichen Itza is correct. By the time of the Spanish conquest the bow and arrow were in use throughout the Maya area. Mexican mercenaries are also credited with the introduction of quilted cotton armor—jackets made of cotton in a kind of pile technique—which the Spaniards found so good that even they used them on occasion.[28]

The hegemony of Mayapan was disliked by everyone save its immediate beneficiaries, the Cocoms and their satellites, who were said to have oppressed the people and reduced large numbers to slavery. Revolt was impossible because of the considerable number of Mexican mercenaries who were in the pay of the Cocoms and because of the support which the powerful Tutul Xius appear to have given to the Cocoms.

The disadvantages which the Maya suffered in offensive and defensive equipment without either bows and arrows or quilted cotton armor were remedied in time; when fully equipped with these novelties they felt better able to tackle the relatively small group of Mexicans. The situation in which a small group of war-loving foreigners is able to dominate a whole series of independent chiefdoms and rule through Quislings has a familiar ring in our ears.

Eventually the Xiu turned against their benefactors, the Cocoms, just, as a century later, they were to betray their countrymen to make common cause with the Spanish invaders and, still later, to inform on other members of their family to the Spaniards for lapses into heathenism. Under the leadership of a certain Ah Xupan Tutul Xiu they led a revolt, and in the words of Bishop Landa, "They conspired to put Cocom to death. And this they did, killing at the same time all his sons except one who was absent."

Following the massacre of the Cocoms at Xiu instigation, Mayapan was sacked, and its famous wall in part torn down. This was about A.D. 1460.

In recent years attempts have been made to work out the family tree of the Xiu (many of their descendants, for the most part born out of lawful wedlock, still live in Yucatan, but are now deservedly reduced to the humble rank of peons) and to exalt them as America's oldest royal family. Personally, I have little patience with such romanticisms. A family of Quislings which has betrayed its fellow countrymen three times in a century might be allowed to sink, if not gracefully, at least silently, into well-merited obscurity.

---

[28] It has been suggested that sculptured door-jambs on a Puuc building at Kabah (see Roys, 1943, Fig. 11) show warriors wearing quilted cotton armor. If that were so, it would place the introduction of that trait in Yucatan much earlier. However, it is much to be doubted that the design does in effect represent quilting.

With the fall of Mayapan, the country dissolved once more into its component parts. There seems to have been a general abandonment of cities occupied before the fall of Mayapan. At the time of the arrival of the Spaniards, less than a century later, the northern area was divided into some eighteen independent states or chiefdoms, each with its own petty ruler called Halach Uinic ("Real man") or Ahau. An interesting commentary on the deeply religious inspiration of life, even at this time, is to be found in Bishop Landa's statement that at the fall of Mayapan there was a scramble among the newly liberated chiefs to get as many of the hieroglyphic books as possible, for with the information contained in them the priests could make successful prognostications as to the future.

The Xius, unable or unwilling to don the mantle of the Cocoms, retired to Mani, northeast of the Puuc range, which became their new capital. The son of the last Cocom ruler, who escaped death through having been away on a trading expedition to Honduras at the time of the massacre, gathered the remnants of the family and settled at Tibulon, near Sotuta, which lies not very far west of Chichen Itza. The ruins of Chichen Itza, however, fell within the territory of the Cupuls, who held a considerable belt of land to the east. The Mexican mercenaries who had aided the Cocoms were given the choice of returning to Xicalango or settling in Yucatan. They chose the second alternative and were ceded a number of towns on the west coast. Less than a century later the Spaniards found them completely Maya-ized.

After the Xius and the reorganized Cocoms, the most important family in western and northern Yucatan was that of the Chels. The founder of this house was a son-in-law of Ah Xupan Tutul Xiu, who had plotted the overthrow of the Cocoms. The Chels occupied the north coast of central Yucatan, a center of the salt-making industry where salt was obtained from shallows. Continuing the feud of their founder's father-in-law, they refused to supply salt or fish to the Cocoms, whose landlocked territory lay to the south of them, obliging them to send far afield for these commodities. The Cocoms retaliated by refusing the Chels game and certain fruits from their territory. Because of the treachery of Ah Xupan Tutul Xiu, bad blood between Xius and Cocoms continued until after the Spanish conquest. Long periods of consequent strife and a series of hurricanes and pestilences prevented any cultural progress, although Maya culture was so obviously on the downgrade, that one doubts whether a period of tranquility would have improved matters.

Practically no archaeological material has been recovered from this period. Indeed, it is to be doubted if there is much to recover. It was clearly a period of recession of Maya culture, and, if the Spaniards had not arrived when they did, it seems not improbable that Yucatan, sooner or later, would have fallen a victim in the expanding power of the Aztec confederation.[29]

It is not a good curtain for Maya civilization. If the hero has to be killed in the last act, one has a right to demand a dramatic end—a Caesar falling wrapped in his toga, or at least a poignant if comfortable death in bed. It is hardly fair to the historian to force him to record that the hero, weakened largely by his own vices, allows himself to be contemptuously pushed off the stage. "A withered wire moves a thin ghost of music in the spinet."

The Spaniards, on their arrival in Yucatan, were actively aided by the Xius and passively supported by the benevolent neutrality of the Chels, but the Xius did not long enjoy the dubious benefits of their treachery. In 1536, after the Spaniards had temporarily withdrawn from northern Yucatan, the Xius sought permission to cross Cocom territory on a pilgrimage to the sacred cenote at Chichen Itza so that they might offer sacrifices there. Permission was forthcoming, but the Cocoms surrounded and set fire to the hut in which the principal Xius were resting from their journey across Cocom territory and succeeded in massacring forty of the party.

Although one cannot condone such treachery, the Xius clearly merited reprisals. They had already sided with the Spaniards, and this pilgrimage must have looked to the Cocoms very much like running with the hare after the hounds had to all appearances retired permanently to their kennels.

By 1541 the Spaniards had firmly established themselves in Yucatan, and, except for the Itza at Tayasal, Maya independence and Maya civilization had come to an end.

---

[29] Roys, 1943, gives an excellent picture of Yucatan at the time of the Spanish conquest. This and earlier parts of the history of Yucatan are covered with great care in Tozzer, 1941, a work rivalling in thoroughness Eames' annotated *Antiquities of Nepenthe*.

The main features of the historical framework are summarized below.

FORMATIVE PERIOD. Prior to A.D. 325

Monochrome pottery resembling Chicanel types of central area. Large pyramidal structures at Yaxuna. No carved stelae, probably no vault.

INITIAL SERIES PERIOD

First half A.D. 325 to *ca.* A.D. 625 Pottery equatable with Tzakol (basal-flanged bowl phase) of central area. Early Peten-style architecture rather widespread. Hieroglyphic stelae and lintels, but on a much smaller scale than in the central area.

Second half. A.D. 625 to A.D. 900 Slate wares. Little evidence of influences or imports from central area. Z-type fine orange ware. Puuc, Rio Bec, and Chenes styles developed in their respective areas (all thin veneer masonry); Middle Peten architecture survives at Coba; Maya style at Chichen Itza. Hieroglyphic stelae and lintels. Theocratic government.

TRANSITION. A.D. 900 to A.D. 987

General abandonment of Puuc, Rio Bec, and Chenes sites at start of transition. Uxmal abandoned a few decades later. Chichen Itza abandoned or in state of cultural suspense. Nothing known of pottery types, but some Mexican influences probably appearing. Perhaps first appearance of metal in small quantities. Stela cult extinct.

MEXICAN PERIOD. A.D. 987 to A.D. 1204

Effigy plumbate and fine orange Type X diagnostics of period. Metals, turquoise, rock crystal. Mexican-influenced Itza conquer Chichen Itza, Izamal, and Mayapan. Strong Tula penetration. Militarism and eclipse of old Maya culture. Worship of Quetzalcouatl, Tlalchitonatiuh, and Tezcatlipoca. Architecture an amalgamation of Tula and old Maya features. No hieroglyphic texts. Period ended by conquest of Chichen Itza by Hunac Ceel.

MEXICAN ABSORPTION PERIOD. A.D. 1204 to A.D. 1540

Red ware and effigy pottery, largely incensarios. Centralized government of Cocoms at Mayapan. Mexican features on wane. Architecture, sculpture, and ceramics on low level. After fall of Mayapan (*ca.* A.D. 1460), Yucatan alone split into some eighteen independent and warring *cacigazcos*, and cities appear to have been completely abandoned. Ends with Spanish conquest.

BIBLIOGRAPHY

ACOSTA, J.
1940. "Exploraciones en Tula, Hidalgo, 1940." *Revista Mexicana de Estudios Antropológicos*, Vol. 4, pp. 172–194.
1943. "Los colosos de Tula." *Cuadernos Americanos*, Year 2, No. 6, pp. 138–146.

ANDREWS, E. W.
1943. *The Archaeology of Southwestern Campeche*, Carnegie Institution of Washington, Publication No. 546, Contribution No. 40.

BEYER, H.
1941. "A Discussion of J. Eric Thompson's Interpretations of Chichen Itza Hieroglyphs." AMERICAN ANTIQUITY, Vol. 6, pp. 327–338.

BLOM, F.
1932. "Short Summary of Recent Explorations in the Ruins of Uxmal, Yucatan." *Proceedings, 24th International Congress of Americanists, Hamburg, 1930*, pp. 55–59.

BRAINERD, G. W.
1941. "Fine Orange Pottery in Yucatan." *Revista Mexicana de Estudios Antropológicos*, Vol. 5, pp. 163–183.

CASO, A.
1940. "El entierro del siglo." *Revista Mexicana de Estudios Antropológicos*, Vol. 4, pp. 65–76.

ESCALONA RAMOS, A.
1944. "Areas y estratos arquelógico-culturales de la América media." *Boletín de la Sociedad Mexicana de Geografía y Estadística*, Vol. 59, pp. 41–66.

GANN, T. W. F.
1926. *Ancient Cities and Modern Tribes*. London and New York.

LOTHROP, S. K.
1924. *Tulum, an Archaeological Study of the East Coast of Yucatan*. Carnegie Institution of Washington, Publication No. 335.

MALER, T.
1895. "Yukatekische Forschungen." *Globus*, Vol. 68, pp. 247–259, 277–292.
1902. "Yukatekische Forschungen." *Globus*, Vol. 82, pp. 197–230.

MARQUINA, I.
1928. *Estudio arquitectónico comparativo de los monumentos arqueológicos de México*. Secretaría de Educación Pública, Mexico.

MORLEY, S. G.
1938. "The Maya New Empire." In *Cooperation in Research*. Washington.

MORRIS, E. H., J. CHARLOT AND A. A. MORRIS
1931. *The Temple of the Warriors at Chichen Itzá*,

Yucatan. Carnegie Institution of Washington, Publication No. 406.

NOGUERA, E.
1940. "Expedición científica mexicana. Cerámica de Quintana Roo." *El México Antiguo*, Vol. 5, pp. 9-20.

PALACIOS, E. J.
1935. *Guía arquelógica de Chichén Itzá*. Secretaría de Educación Pública. Mexico.

POLLOCK, H. E. D.
1936. *The Casa Redonda at Chichen Itza, Yucatan*. Carnegie Institution of Washington, Publication No. 456. Contribution No. 17.

RICKETSON, E. B.
1927. "Sixteen Carved Panels from Chichen Itza, Yucatan." *Art and Archaeology*, Vol. 23, pp. 11–15.

ROYS, R. L.
1933. *The Book of Chilam Balam of Chumayel*. Carnegie Institution of Washington, Publication No. 438.
1943. *The Indian Background of Colonial Yucatan*. Carnegie Institution of Washington, Publication No. 548.

RUPPERT, K.
1931. *The Temple of the Wall Panels, Chichen Itza*. Carnegie Institution of Washington, Publication No. 403, Contribution No. 3.
1935. *The Caracol at Chichen Itza, Yucatan, Mexico*. Carnegie Institution of Washington, Publication No. 454.

RUPPERT, K., AND J. H. DENISON
1943. *Archaeological Reconnaissance in Campeche, Quintana Roo, and Peten*. Carnegie Institution of Washington, Publication No. 543.

SATTERTHWAITE, L.
1942. "Opposed Interpretations of Dates and Hieroglyphic Styles at Chichen Itza." *Revista Mexicana de Estudios Antropológicos*, Vol. 6, pp. 19–35.

SHOOK, E. M.
1940. "Exploration in the Ruins of Oxkintok, Yucatan." *Revista Mexicana de Estudios Antropológicos*, Vol. 4, pp. 165–171.

SMITH, R. E.
1937. *A Study of Structure A-1 Complex at Uaxactun, Peten, Guatemala*. Carnegie Institution of Washington, Publication No. 456, Contribution No. 19.

THOMPSON, E. H.
1938. *The High Priest's Grave, Chichen Itza, Yucatan, Mexico*. Field Museum Natural History, Anthropological Series, Vol. 27, No. 1.

THOMPSON, J. E. S.
1937. *A New Method of Deciphering Yucatecan Dates with Special Reference to Chichen Itza*. Carnegie Institution of Washington, Publication No. 483, Contribution No. 22.
1941. "A Coordination of the History of Chichen Itza with Ceramic Sequences in Central Mexico." *Revista Mexicana de Estudios Antropológicos*, Vol.5, pp. 97–111.
1942. *Representations of Tezcatlipoca at Chichen Itza*. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, No. 12.
1943*a*. *Pitfalls and Stimuli in the Interpretation of History through Loan Words*. Middle American Research Institute, Philological and Documentary Studies, Vol. 1, No. 2.
1943*b*. *Representations of Tlalchitonatiuh at Chichen Itza, Yucatan, and at El Baul, Escuintla*. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, No. 19.
1943*c*. "A Trial Survey of the Southern Maya Area." AMERICAN ANTIQUITY, Vol. 9, pp. 106–134.
1943*d*. "Las Llamadas 'Fachadas de Quetzalcouatl.'" *Proceedings, Twenty-seventh International Congress of Americanists, Mexico, 1939*, pp. 391–400.

THOMPSON, J. E. S., H. E. D. POLLOCK, AND J. CHARLOT
1932. *A Preliminary Study of the Ruins of Coba, Quintana Roo, Mexico*. Carnegie Institution of Washington, Publication No. 424.

TOZZER, A. M.
1917. "The Chilam Balam Books and the Possibility of their Translation." *Proceedings, 19th International Congress of Americanists, Washington, 1915*, pp. 178–186.
1930. "Maya and Toltec Figures at Chichen Itza." *Proceedings, 23rd International Congress of Americanists, New York, 1928*, pp. 403–412.
1941. *Landa's Relacion de las cosas de Yucatan*. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. 18.

TRIK, A. S.
1939. *Temple XXII at Copan*. Carnegie Institution of Washington, Publication No. 509, Contribution No. 27.

VAILLANT, G. C.
1933. "Hidden History." *Natural History*, Vol. 33, pp. 618–628.

Carnegie Institution of Washington
Cambridge, Massachusetts
Written, 1941; revised December, 1944

THE HISTORICAL SIGNIFICANCE OF THE MURALS IN THE TEMPLE OF THE WARRIORS, CHICHEN ITZA

DONALD E. WRAY

ACCORDING to Alfred M. Tozzer, events relating to the taking of Chichen Itza by the Toltecs are depicted in the frescoes and bas-reliefs on buildings at that site which date from the Mexican period. In a paper entitled "Maya and Toltec Figures at Chichen Itza,"[1] he analyzes scenes from the Temple of the Jaguars, the Monjas, the North Temple of the Ball Court, and the Northeast Colonnade with reference to the known historic conquest and interprets them as portrayals of the Mexican attacks, the submission of the Maya, and the recognition of Toltec supremacy.

In his paper, Tozzer tells us that the Toltec warrior is characterized by a mosaic headdress; a breast ornament, probably also of mosaic; a back shield or dorsal mirror; decorated garters; bands below the knee; and sandals. He carries a bundle of spears and a bag in his left hand and an atlatl in his right. His left arm is protected by padding or a round shield. He usually wears a conventionalized bird design as part of his headdress or breast ornament, although this is sometimes replaced by a realistic bird. His nose ornament is a button or pendant in contrast to the long bead worn by the Maya.

At the time Tozzer wrote his article, the results of the excavations in the Temple of the Warriors were not available. However, he predicted that "the Warrior Temple may show, retrospectively perhaps, as this building has a decadent style and is undoubtedly later than the Ball Court Group, a pure Toltec structure approached through a colonnade recounting the Maya subjugation." Morris and Charlot have made a detailed analysis of the various elements shown in the murals and have recognized the presence of the characteristics which Tozzer calls "Toltec."[2] The present paper is concerned with the interpretation of the entire pattern of action which can be seen in the four scenes which have been reconstructed more or less completely. It may be regarded as a continuation of Tozzer's work and an application of his hypothesis to the murals from the Temple of the Warriors.

The first of these murals[3] shows a village undergoing attack by a group of warriors. The defenders are distinguished by horizontal parallel brown lines painted over their entire bodies. Their costumes consist of sandals, white garters or leg bands, red loincloths, sometimes red shirts or tunics, earplugs, simple feather headdresses, and round shields with red centers and decorations of white feathers. The attackers have solid black body paint, except for their hands and in some cases their faces, and wear sandals, blue loincloths, earplugs, rectangular or round breast ornaments, and turbans with three or four large plumes. They carry small round shields which are white but lack feather decorations. That the attacking force is winning is shown by the prostrate figures of two defenders and by the line of captives who have been stripped and bound and are being led away by members of the attacking party.

At the lower edge of this scene, near the line of captives and victors, there intrudes a plumed-serpent head which seems to bear no relationship to the rest of the picture. A similar example is found in the murals of the Jaguar Temple, where the plumed serpent is connected with the attacking force. This would seem to indicate that Quetzalcouatl was the patron of the attacking force in each case. Similarly, in the mural under discussion, an anthropomorphic jaguar may represent the association of Jaguar warriors.

The second mural[4] from the Temple of the Warriors shows a water scene after a battle between black-painted warriors and a red people with long yellow hair. The latter are shown as having fallen in battle or bound as captives. Another part of the mural[5] shows one of the yellow-haired people, with green beads strung in his hair, about to be sacrificed to Quetzalcouatl. He is held by two of the black-painted

[1] *Proceedings of the 23rd International Congress of Americanists*, pp. 155–164.

[2] Earl H. Morris, Jean Charlot, and Ann Axtell Morris, *The Temple of the Warriors at Chichen Itza, Yucatan*, Carnegie Institution of Washington, Publication No. 406, 1931.

[3] *Ibid.*, Vol. 2, Pl. 139.

[4] *Ibid.*, Pl. 146.

[5] *Ibid.*, Pl. 145.

men over a block which is part of the coiled serpent body. A priest, also black, holds a knife poised above the victim. The priest wears blue cuffs, a blue tunic, and a green headband to which are fastened a yellow-trimmed white disk and three plumes.

A third section of mural[6] shows a white pyramid, on the summit of which is a huge jaguar. Before the crouching animal is a tripod incense burner painted with horizontal green and white stripes crossed by black bars. Associated with this picture is a series of objects such as a bowl of incense grains, lengths of cloth, and a feathered headdress which in style and arrangement resembles the tribute rolls of the Aztec codices.

The fourth scene shows a seacoast village in considerable detail.[7] The significant objects for this discussion are a series of canoes in the water. Each is propelled by an oarsman wearing a white kilt and white turban and carries, in addition, two brown-skinned warriors dressed in brown or green tunics, white turbans, and earplugs and carrying round shields, atlatls, and sheaves of arrows. In contrast to the other scenes of battle and sacrifice, this mural shows a village at peace and warriors passing by without attacking. A clue to this situation may be found in the fact that the figure of Quetzalcouatl hovers over a shrine in the village, indicating either acceptance of Mexican gods or Mexican rule, or both.

The interpretation of the murals described above rests in part on the work of Tozzer and in part on the context in which they occur. The Temple of the Warriors seems to be, as Tozzer predicted, a building of pure Toltec inspiration. The predominance of warrior figures in the sculptures and the presence of Jaguar and Eagle symbols representing the warrior associations would seem to confirm the interpretation that the temple was especially dedicated to the military organizations of the Toltec. We might expect that murals placed in such a structure would commemorate the conquests of the builders. There arises the problem of the identification of Toltec and Maya groups in the murals in situations which would bear out this hypothesis.

In none of the reconstructed sections of murals described does the "typical" Toltec warrior appear. This may be explained by the fact that in the complete mural sections the warriors are shown in actual fighting dress, whereas the "typical" warrior costume is found only in scenes of a ceremonial or formal nature. In scenes of active fighting, we might expect to find a much simpler costume. The full warrior costume occurs in other portions of the mural fragments which seem to have formed a procession.[8] The only figure with a majority of the typical traits which can be tied into a scene is shown in Morris' Plate 143, *b*. This fragment shows a warrior with the round blue earplug, blue nosebutton and pendant, blue bird-form necklace, quilted sleeve, basket, and darts.

The black warriors have been identified by Morris and Charlot as Toltec, in spite of the lack of distinctive costume. Black body paint combined with the use of the back shield and the atlatl is depicted in a mural from the Temple of the Jaguars. The atlatl and sheaf of spears occur in the hands of canoe-born warriors in the last mural described. In addition, there is a difference in the physical features of Mexican and Maya. The Mexican has a rounded or straight forehead and a short snub nose; the Maya has a high forehead and a prominent nose. The first of these physical types coincides with the black warriors who are victorious in all scenes, the second with the light people who are captives and subjects.

The long yellow hair of the captives in the second mural demands further explanation. Thompson, in a paper entitled "Representations of Tlalchitonatiuh at Chichen Itza, Yucatan, and at Baul, Escuintla,"[9] has identified the yellow hair with green beads as an attribute of the Mexican sun god which was assumed by sacrificial victims, prisoners, and warriors engaged in battle. This explanation is adequate for the scene of sacrifice to Quetzalcouatl but does not quite explain the presence of this hair ornamentation in the actual battle scene, where it is found on a group of persons who are unarmed and, furthermore, have the deformed head and prominent nose which characterize the Maya. Possibly this group was engaged in ritual activity when it was intercepted by the black warriors.

Another feature which aids in the identification of the Toltecs is the presence of the figure of Quetzalcouatl. In the first mural, the feath-

[6] *Ibid.*, Pl. 151.
[7] *Ibid.*, Pl. 159.
[8] *Ibid.*, Pls. 150, *c*; 152, *a*; 155, *a*; 156, *b*; 161, *d*.
[9] *Notes on Middle American Archaeology and Ethnology*, No. 19, Carnegie Institution of Washington, 1943, p. 118.

ered serpent is associated with the line of victorious warriors and their captives; in another, a scene depicting sacrifice, the black warriors are servants of the plumed serpent; and in still another, a group of Toltec warriors is passing, without molesting it, a coastal village over whose shrine appears the figure of Quetzalcouatl.

While the costumes of the conquered group vary, the physical type and the use of striped body paint are fairly constant. The physical peculiarities of the Maya can be recognized even in the case of the unusual group with decorated yellow hair, and the sacrificial scene is an especially vivid portrayal of the subjection of the Maya type.

If these interpretations are correct, we have in the murals from the Temple of the Warriors a pictorial record of the political and military subjugation of the Maya by the Toltec. This analysis is strengthened by the position of the murals in a building which seems to have been dedicated primarily to a warrior cult.

The murals would indicate that much of the conquest took place along the coast. Two battle scenes take place near the sea, while in the one peaceful scene a line of canoes carries Toltec warriors past a village over which their special deity, Quetzalcouatl, is dominant. In other murals we see Mayan captives being led away and sacrificed to the Mexican god and, apparently, the presentation of tribute to the patron animal of one of the warrior associations.

5526 Ellis Avenue
Chicago, Illinois
July, 1944

CHICHEN ITZA INSCRIPTIONS AND THE MAYA CORRELATION PROBLEM

R. B. WEITZEL

NUMEROUS calendric hieroglyphs of inscriptions at Chichen Itza have been deciphered, with the result that a large body of new material is available for a fresh approach to a solution of the Maya correlation problem. Furthermore, there has appeared a new method of interpreting native time counts which will necessitate revised ideas concerning the chronology of inscriptions, of architecture, of cultural changes, and of historical events at Chichen Itza.

Formerly it was thought that the Maya date 9 Lamat 11 Yax, 13 Tun 1 Ahau meant that the calendar round date 9 Lamat 11 Yax, with a positional determinant 13 Tun 1 Ahau, fell in 13 Tun ending on a day 1 Ahau. This Tun-Ahau method of interpreting a date rested on a fallacy and produced a result irreconcilable with the data. According to the new Katun-Ahau method, the given date, 9 Lamat 11 Yax, fell in a current 13 Tun of a current Katun ending on a day 1 Ahau; this is thoroughly consistent.

In the following tabulation, chronological parts of the Chichen Itza inscriptions, under description headings, appear in this order: serial number; long count interpretation, according to the Katun-Ahau method;[1] reading of the time count, whether calendar round date or positional determinant; figure number; and substance of Beyer's deciphering.[2] The initial in parentheses refers to Thompson, Beyer, Morley, or the writer as proposer of a given reading or interpretation.

[1] Thompson, 1937, pp. 179–197.
[2] Beyer, 1937, pp. 127–174.

HACIENDA, LINTEL (WATER TROUGH)

1	10.1.17. 5.13 (T)	11 Ben	11 Cumhu	(T)	646	11 Kan	12 Cumhu
2	10.1.18. 0. 0 (T)	18 Tun	3 Ahau	(T)	692	17–19 Tun	3 Ahau
3	10.1.17.10 0 (W)	7 Ahau	13 Zotz	(W)	700	13 —	7 Ahau
4	10.1.18. 6. 5 (T)	6 C'chan	18 Cumhu	(T)	647	7(?) —	17 Cumhu
5	10.1.19. 0. 0 (T)	19 Tun	3 Ahau	(B)	701	19 Tun	3 Ahau

HALAKAL, LINTEL

6	10.2. 0. 3. 3 (W)	1 Akbal	6 Muan	(W)	666	10 —	6 Muan
7	10.2. 1. 0. 0 (W)	1 Tun	1 Ahau	(B)	676	1 Tun	1 Ahau
8	10.2. 0. 7. 9 (T)	9 Muluc	7 Pop	(T)	667	4 Kan	7 Pop
9	10.2. 1. 0. 0 (T)	1 Tun	1 Ahau	(B)	674	1 Tun	1 Ahau

			CASA COLORADA, HIEROGLYPHIC BAND, 27–29, 33–35, 47–48, 51, 54				
10	10.2. 0.15. 3 (T)	7 Akbal	1 Chen	(T) 637	9 Akbal	1 Chen	
11	10.2. 1. 0. 0 (T)	1 Tun	1 Ahau	(B) 671	1 Tun	1 Ahau	
12	10.2. 1. 0. 0 (W)	1 Tun	1 Ahau	(W) 695	1 Tun		
13	10.2. 2. 0. 0 (W)	2 Tun	1 Ahau	(W) 696	2 Tun		
14	10.2. 3. 0. 0 (W)	3 Tun	1 Ahau	(W) 697	3 Tun		
			AKAB TZIB, LINTEL				
15	10.2. 1. 0. 0 (T)	1 Tun	1 Ahau	(M) 670	1 Tun	1 Ahau	
16	10.2. 9. 0. 0 (W)	9 Tun	1 Ahau	(W) 707	9 Tun		
17	10.2.11. 0. 0 (W)	11 Tun	1 Ahau	(B) 682	11 Tun	1 Ahau	
			YULA, LINTELS I AND II				
18	10.2. 4. 8. 4 (T)	8 Kan	2 Pop	(T) 663	1 Kan	2 Pop	
19	10.2. 5. 0. 0 (T)	5 Tun	1 Ahau	(B) 689	5 Tun	1 Ahau	
20	10.2. 4. 2. 1 (T)	2 Imix	4 Mac	(T) 643	— Imix	4 Tzec	
21	10.2. 4. 8.12 (T)	3 Eb	10 Pop	(B) 644	3 Eb	10 Pop	
22	10.2. 5. 0. 0 (T)	5 Tun	1 Ahau	(B) 688	5 Tun	1 Ahau	
23	10.2. 5. 0. 0 (W)	5 Tun	1 Ahau	(W) 679	13(?) Tun	1 Ahau	
			INITIAL SERIES TEMPLE, LINTEL				
24	10.2. 9. 1. 9 (M)	9 Muluc	7 Zac	(M) 702	9 Muluc	7 Zac	
25	10.2.10. 0. 0 (M)	10 Tun	1 Ahau	(B) 680	10 Tun	1 Ahau	
			TEMPLE OF THREE LINTELS, LINTEL III				
26	10.2.10. 0. 0 (T)	10 Tun	1 Ahau	(M) 681	10 Tun	1 Ahau	
			CASA DE LAS MONJAS, LINTELS 2, 3, 4, 5, 6				
27	10.2.10.11. 7 (T)	8 Manik	15 Uo	(T) 631	8 Manik	15 Uo	
28	10.2.11. 0. 0 (T)	11 Tun	1 Ahau	(B) 683	11 Tun	1 Ahau	
			TEMPLE OF FOUR LINTELS, LINTELS I, II, III, IV				
29	10.2.12. 1. 8 (T)	9 Lamat	11 Yax	(M) 639	9 Lamat	11 Yax	
30	10.2.13. 0. 0 (T)	13 Tun	1 Ahau	(M) 678	13 Tun	1 Ahau	
31	10.2.12. 2. 4 (T)	12 Kan	7 Zac	(T) 642	12 Kan	(2)? Zac	
32	10.2.13. 0. 0 (T)	13 Tun	1 Ahau	(M) 649	13 Tun	1 Ahau	
33	10.2.12. 2. 4 (W)	12 Kan	7 Zac	(W) 665	12(?) Muluc	7 —	
			HIGH PRIEST'S GRAVE, COLUMN				
34	10.2.12.16. 0 (W)	2 Ahau	18 Xul	(M) 668	2 Ahau	18 —	
35	10.2.13. 0. 0 (W)	13 Tun	1 Ahau	(W) 694	11 Tun	2 Ahau	
			TEMPLE OF THE OWL, CAPSTONE				
36	10.2.13. 0. 0 (W)	13 Tun	1 Ahau	(M) None	None		
			TEMPLE OF HIEROGLYPHIC JAMBS				
37	10.2.15. 2.13 (W)	9 Ben	1 Zac	(W) 645	9 Ben	— Zac	
38	10.2.16. 0. 0 (W)	16 Tun	1 Ahau	(W) 713	Ending of Tun		
			CARACOL, STELA				
39	10.2.16. 0. 0 (T)	16 Tun	1 Ahau	(B) 691	16 Tun	1 Ahau	
40	10.2.17. 0. 0 (T)	17 Tun	1 Ahau	(T) 711	17 Tun		
41	10.3. ?. 0. 0 (W)	(?) Tun	12 Ahau	(W) 720		12 Ahau	
42	10.3.17. 0. 0 (W)	17 Tun, 10 Baktun, 3 Katun 772			17 Tun, 11 Baktun, 3 Katun		
			CARACOL, HIEROGLYPHIC BAND, BLOCKS 9, 16, 17, 18, 5				
43	10.2. 8. 0. 0 (W)	8 Tun	1 Ahau	(B) 687	8 Tun	1 Ahau	
44	10.2.12. 6. 4 (W)	1 Kan	7 Muan	(W) 638	3(?) Kan	7 Muan	
45	10.2.16. 0. 0 (T)	16 Tun	1 Ahau	(B) 690	16 Tun	1 Ahau	
46	10.3. 0. 2. 1 (W)	3 Imix	4 Chen	(W) 664	3 Imix	14 Yax	
47	10.3. 1. 0. 0 (W)	1 Tun	12 Ahau	(B) 693	1 Tun	12 Ahau	
48	10.3.16. 0. 0 (W)	16 Tun	3 Katun	(W) Block 5	Plate 14		
			TEMPLE OF ONE LINTEL, LINTEL				
49	10.3.16. 0. 0 (W)	16 Tun	12 Ahau	(W) —	16–19 Tun	11–13 Ahau	

			Temple of Wall Panels, Serpent's Tail			
50	10.3.16. 0. 0 (W)	16 Tun	3 Katun	(B) 710, 705	16 Tun	3 Katun
			Tomb, Capstone			
51	10.3. 8.14. 4 (W)	6 Kan	2 Pop	(M) 715	6 Kan	
52	10.3. 9. 0. 0 (W)	9 Tun	12 Ahau	(W) 715	9 Tun	

The tabulated time counts fall within a period of approximately forty years, ranging from 10.1.17.5.13 of the Hacienda lintel to 10.3.17.0.0 of the Caracol stela. The long count, 10.3.17.0.0, is effectively recorded, "end 17 Tun, end 10 Baktun, (end) 3 Katun," and constitutes an important dedicatory date.

Some of the readings and interpretations given in the table will receive comment. Since the reading 11 Ben 11 Cumhu, figure 646, No. 1, appears the best under existent circumstances, the warrant for its tabulation is deemed ample. Another possible reading, with interpretation, is 10.1.16.5.9, 11 Muluc 12 Cumhu. Were this doubtful reading proved correct, it would not affect materially the broad purpose in view. The essential factor to be noted is that the date, whatever its proper reading, fell in 17, 18, or 19 Tun of a Katun 3 Ahau; thus, the margin of error is restricted. The approximate dating of an inscription with restricted margin of error is desirable. There have been readings and interpretations of Maya time counts in the past that erred by more than five hundred years.[3]

The date 7 Ahau 13 Zotz, figure 700, No. 3, is recorded in an order that is the reverse of normal practice. It reads 13 Zotz 7 Ahau, with month sign preceding day sign. However, a stela at Copan bears a date of similar character, 8 Yaxkin 5 Ahau, with month and day signs likewise reversed, and the comment has been made: "Stela 16 registers a date which is pretty clearly 5 Ahau 8 Yaxkin, although these glyphs are given in reverse order which is most unusual."[4]

Figure 671, No. 11, records a positional determinant, 1 Tun 1 Ahau, while the successive figures—695, 696, and 697—of the same hieroglyphic band record, respectively, 1 Tun, 2 Tun, and 3 Tun, without an Ahau element. A reasonable inference is that these Tuns likewise fell in the recorded Katun 1 Ahau.

An inscription painted on the tomb capstone, figure 715, No. 51, invariably has been assigned the long count position 11.12.8.13.4; whereas the independent tabulated interpretation of the inscription is 10.3.8.14.4. The two divergent interpretations of the same data differ by eleven calendar rounds,—about 572 years—a considerable difference in time.

On block 17 of the Caracol hieroglyphic band, figure 690, No. 45, is recorded a positional determinant, 16 Tun 1 Ahau; on the companion block 18, figure 693, No. 47, is recorded 1 Tun of a succeeding Katun 12 Ahau, five tuns or slightly less than five years later. A date on block 18, figure 664, No. 46—which in the past has been read, 3 Imix 9 Yax and 3 Imix 14 Yax —is given a tabulated reading 3 Imix 4 Chen. Whatever is the correct reading of the date, it is highly probable that it fell in Katun 12 Ahau, which is the important factor, since the margin of error is restricted.

The inscription on the column of the High Priest's Grave is badly damaged by weathering, erosion, and other destructive agencies, to such an extent that divers glyphs with coefficients are indecipherable. A date 2 Ahau 18 Xul, as read by Morley and Spinden, is accorded a tabulated interpretation, No. 34, which conforms to the pattern of the Chichen Itza inscriptions. It may be remarked that the damaged inscription, with pertinent time glyphs admittedly indecipherable, can be given various readings and interpretations of doubtful validity.

Worthy of consideration is the interrelationship of some epigraphic and architectural material at Chichen Itza. Important in this connection is the Initial Series lintel which has on its underside the long count date 10.2.9.1.9, 9 Muluc 7 Zac, and on its front a positional determinant, 10 Tun 1 Ahau.

It has been stated that the Initial Series lintel had been re-used as a wall stone in the late vaultless temple in which it was found. However, the photograph in Field Museum files, taken by E. H. Thompson at the time of the discovery of the lintel, shows it lying immediately behind the Atlantean figures, and the impression is very strong that it was originally in position resting on their tops.[5]

[3] Weitzel, 1930, pp. 182–185.

[4] Spinden, 1924, p. 216.

[5] Thompson, 1935, p. 72, note 2.

A natural color photograph[6] shows the stone lintel placed atop two Atlantean figures, with an accompanying note to the effect that the front of the lintel bears the dedicatory date of the temple. Another writer states:

> In the light of these formal criteria we can now take the doorway of the Temple of the Initial Series at its face value, that is, the Atlantean figures and the lintel are contemporaneous.[7]

It is evident that the Initial Series lintel at Chichen Itza was originally in place on the tops of the Atlantean figures, thereby constituting an inscriptional component of the front doorway, and that it recorded the dedicatory date of the Initial Series temple, 10.2.10.0.0, 10 Tun of Katun 1 Ahau.

The Monjas at Chichen Itza was habitable when the Spaniards arrived during the early decades of the sixteenth century. On five of the seven stone lintels which spanned doorways of the upper story of the Casa is recorded the calendar round date 8 Manik 15 Uo, and on four lintels the positional determinant 11 Tun 1 Ahau, or 10.2.11.0.0.

The positional determinant 13 Tun 1 Ahau, or 10.2.13.0.0, is recorded eight times on four stone lintels of the Temple of Four Lintels. A similar positional determinant, 13 Tun 1 Ahau, was painted on a capstone found in the Temple of the Owl.[8]

A time count, 16 Tun 3 Katun, corresponding to 10.3.16.0.0, is sculptured on a serpent column in the Temple of the Wall Panels, a structure midway between the Caracol and the Casa de las Monjas.

The Caracol at Chichen Itza has a round tower characteristic of the Quetzalcouatl cult. Other architectural features are balustrades of intertwined serpents, elaborate stone roof ornaments, mask and statuette panels similar to those of the Casa de las Monjas, and Tlaloc incensarios. A time count, presumably 16 Tun 3 Katun, appears on block 5 of the hieroglyphic serpent band which was originally above the medial cornice of the round tower. The serpent-bordered stela, shrined in a niche between the two divisions of the upper stairway, records 17 Tun, 10 Baktun, 3 Katun. This grand dedication date of the Caracol, 10.3.17.0.0, is three tuns before the Katun-ending date 10.4.0.0.0, 12 Ahau 3 Uo.

[6] Marden, 1936, Plate XIII.
[7] Beyer, 1937, pp. 163–164.
[8] Morley, 1927, p. 235, note 1.

Some inscriptions of a city contemporaneous with Chichen Itza will be briefly reviewed; namely, the Monjas and Ball Court inscriptions at Uxmal.[9] They have been read and interpreted:

11.12.17.11. 1	5 Imix	19 Kankin	Monjas
11.15.16.12.14	10 Ix	17 Pop	Ball Court

These interpreted dates are compared with the latest authentic date at Chichen Itza, with impressive results.

10. 3.17. 0. 0	Caracol stela
1. 9. 0.11. 1	572 years approx.
11.12.17.11. 1	Monjas, Uxmal
10. 3.17. 0. 0	Caracol stela
1.11.19.12.14	630 years approx.
11.15.16.12.14	Ball Court, Uxmal

The Monjas and Ball Court dates at Uxmal would be respectively 572 years and 630 years later than the Caracol stela date at Chichen Itza; these intervals are incredible. It has been demonstrated very convincingly that the proper interpretation of the inscription on the Monjas at Uxmal is 10.3.17.12.1, 5 Imix 19 Kankin.[10] The Ball Court inscription is independently read and interpreted 10.3.16.17.0, 4 Ahau 18 Pop.

The Caracol stela inscription at Chichen Itza and the Ball Court and Monjas inscriptions at Uxmal are brought together to show their contenporaneity.

10.3.17. 0.0	Caracol stela at Chichen Itza 17 Tun of Katun 12 Ahau
10.3.16.17.0	Ball Court ring at Uxmal in 17 Tun of Katun 12 Ahau
10.3.17.12.1	Monjas capstone at Uxmal in 18 Tun of Katun 12 Ahau

At Labna, southeast of Uxmal, a time count on a long-nosed mask records 13 Tun 3 Ahau[11] and is interpreted 10.1.13.0.0.[12]

An inscription on a jade gorget found at Tzibanche, near Bakhalal, is read 12 Ahau end 4 Katun, with interpretation 10.4.0.0.0, 12 Ahau 3 Uo.[13] This Katun-ending date, 10.4.0.0.-0, 12 Ahau 3 Uo, is noteworthy because the correctness of the interpretation is beyond reasonable doubt and therefore reliable, and especially because it is the latest reliable inscription date found within the Maya area. It follows as a cor-

[9] Weitzel, 1931*b*, pp. 53–56.
[10] Thompson, 1941, p. 107.
[11] Morley, 1920, p. 358.
[12] Thompson, 1937, p. 195.
[13] Beyer, 1932, pp. 133–136.

ollary that any interpretation of an *inscription* which produces a date later than 10.4.0.0.0 may well be received with reserve until proved correct beyond reasonable doubt.

The inscriptions of the Maya area are usually classified as Old Empire or New Empire. Those of Chichen Itza belong to the latter classification. The culture of Chichen Itza is basically Maya, with distinctive foreign features superimposed by the Mexican governing class; accordingly, an appropriate descriptive term for the Chichen Itza culture is Maya-Mexican.

Dates of Old Empire inscriptions are often tied to the long count by initial series, with other dates fixed by secondary series. At Chichen Itza, initial series dates are exceptional; the long count is transformed into a simplified and effective pattern. A date which is recorded as falling in a designated Tun of a Katun ending on a numerated Ahau day is fixed for a great length of time. This method of defining the position of a date is distinctly Maya-Mexican.

Early monuments of the Old Empire bear inscriptions which in many instances are Katun markers; that is, a dedicatory date, declared by a long count, is frequently a Katun-ending date. Later, the Katun was subdivided into Hotuns.[14] At Chichen Itza, Hotun markers are incidental, Tun markers are prevalent. This general use of Tun markers is characteristic of the Maya-Mexican era, and may be indicative of a transitional stage in the chronological system.

Maya-Mexican history is reconstructed in rough outline. Chichen Itza, the leading Maya-Mexican city, formed with Uxmal and Mayapan a tripartite league that dominated the greater part of Yucatan. Allied, the cities flourished. The golden age of Maya-Mexican culture occurred during a period which includes the dates 10.1.13.0.0 and 10.4.0.0.0. After Katun 12 Ahau ended, rivalry for supremacy among the rulers of Chichen Itza, Uxmal, and Mayapan developed into a war that devastated the land, impoverished the people, destroyed central authority, and created the widespread disunity which existed when the Spaniards arrived. As original sources for Yucatecan history, the books of Chilan Balam are contradictory and unreliable.[15]

An approximate correlation of Maya and European chronology is derived from the combined factors of inscriptions, architecture, ceramics,[16] cultural traits, and logic of events. Allowing a margin of sixty years either way, the Katun ending date 10.4.0.0.0, 12 Ahau 3 Uo, is assigned here to A.D. 1428.

[14] Morley, 1917, pp. 195–201.

[15] Weitzel, 1931*a*, pp. 319–323.

[16] Vaillant, 1935, p. 137, "Chart V," etc.

BIBLIOGRAPHY

BEYER, H.
1932. *An Ahau Date with a Katun Ending Sign.* Middle American Research Series, Publication No. 4.
1937. *Studies on the Inscriptions of Chichen Itza.* Carnegie Institution of Washington, Contribution No. 21.

MARDEN, L.
1936. "Today in the Feathered Serpent's City." *National Geographic Magazine*, Vol. 70, No. 5.

MORLEY, S. G.
1917. "The Hotun as the Principal Chronological Unit of the Old Maya Empire." *Proceedings of the 19th International Congress of Americanists.*
1920. *The Inscriptions at Copan.* Carnegie Institution of Washington, Publication No. 219.
1927. "Archaeology." *Carnegie Institution of Washington Year Book*, No. 26.

SPINDEN, H. J.
1924. *The Reduction of Mayan Dates.* Papers of the Peabody Museum, Vol. 6, No. 4.

THOMPSON, J. E.
1935. *Maya Chronology.* Carnegie Institution of Washington, Contribution No. 14.
1937. *A New Method of Deciphering Yucatecan Dates.* Carnegie Institution of Washington, Contribution No. 22.
1941. "A Coordination of the History of Chichen Itza." *Revista Mexicana de Estudios Antropológicos.* Vol. 5, Nos. 2–3.

VAILLANT, G. C.
1935. "Chronology and Stratigraphy in the Maya Area." *Maya Research*, Vol. 2, No. 2.

WEITZEL, R. B.
1930. "Maya Chronological Systems." *American Journal of Archaeology*, Vol. 34, No. 2.
1931*a*. "The Books of Chilan Balam as Tradition." *American Journal of Archaeology*, Vol. 35, No. 3.
1931*b*. "Uxmal Inscriptions." *American Journal of Archaeology*, Vol. 35, No. 1.

Washington, D. C.
February, 1944

THREE VILLAGE SITES OF THE MISSISSIPPI PATTERN IN MINNESOTA

LLOYD A. WILFORD

THE LATE prehistoric cultural manifestations of Minnesota are so dominantly of the Woodland pattern that manifestations of the Mississippi pattern have not received much attention in published reports. Prior to 1940, components of the Orr and Blue Earth foci of the Oneota aspect had been recognized in Minnesota, and some sites of each focus had been studied.[1] Since that time, two additional complexes, which I am ascribing to the Mississippi pattern and have named the Cambria aspect and the Great Oasis aspect, respectively, have been discovered.[2] The Minnesota sites, together with the Brandon site in southeastern South Dakota reported by Over and Meleen[3] and the Mill Creek sites in northwestern Iowa studied by Charles R. Keyes, make an important contribution to our knowledge of the Mississippi pattern in the area near the meeting point of these three states.

Sites of the two foci of the Oneota aspect are rather widely separated. The area of the Orr focus in the extreme southeastern corner of Minnesota is a part of the larger area including the adjacent portions of Iowa and Wisconsin, throughout which sites of this focus are found. The Blue Earth focus centers around the Blue Earth River, which flows north, in south-central Minnesota, to empty into the Minnesota River at Mankato. One site is known at Fort Ridgely on the upper Minnesota River (i.e., above Mankato). The type site of this focus is the Humphrey village site, on a small tributary of the Blue Earth River near Winnebago, Minnesota.

The type site of the Cambria Aspect is an extensive village on the upper Minnesota River, about sixteen miles above Mankato and near the modern village of Cambria. A few smaller sites are nearby, and some destroyed mounds in this vicinity may have belonged to this aspect. Some mounds and a village site at the headwaters of the Minnesota River may be related to this aspect.

The type site of the Great Oasis aspect is a village in Murray County, in the southwestern corner of the state, on the bank of extinct lake Great Oasis. All of the sites now known or believed to belong to this aspect are within twenty-five miles of the type site.

THE VILLAGE SITES

Locations of the Humphrey and Great Oasis villages were not selected with a view to defense. Cambria village is on an elevated terrace of the Minnesota River and is surrounded on three sides by deep ravines. Inasmuch as a small village of the same culture near the Cambria site is similarly situated, it is probable that a trait of this culture was the location of villages on sites favorable for defense. No artificial defenses, such as embankments or ditches, were observable, and no house depressions or trash heaps were evident in any of the three type sites. It cannot be concluded that these features were nonexistent at any of the three sites, for disturbances due to agricultural and industrial operations and to digging by relic-seekers may have destroyed all evidences of them. No house floors were found at any of the sites, but it should be stated that only a small part of the area of each village was excavated.

At each of the three sites there were, in addition to a layer of cultural debris from the surface to the subsoil, numerous storage pits, dug into the subsoil. At the Cambria and Great Oasis sites the layer of debris was of almost uniform depth in the areas excavated, averaging about two feet but at the Humphrey site it varied from 0.9 to 2.7 feet. At each site it contained the usual materials—animal bones, shells, potsherds, flint flakes and nodules, artifacts, rocks, and fireplaces marked by accumulations

	Humphrey	Cambria	Great Oasis
Area excavated	2,390 sq. ft.	800 sq. ft.	800 sq. ft.
Average depth of cultural layer, exclusive of pits	1.8 ft.	2.0 ft.	2.0 ft.
Number of subsoil pits	33	21	16
Number of pits per 100 sq. ft. of area excavated	1.4	2.6	2.0
Number of potsherds obtained	3,681	11,193	5,561
Number of potsherds per 100 sq. ft. of area excavated	154	1,399	695

[1] Wilford, 1941, p. 234. [2] Wilford, 1942, p. 22. [3] Over and Meleen, 1941.

of ashes. The relative frequency of the subsoil pits and the relative richness of the cultural debris at the three villages are indicated by the data listed in the table on page 32.

Subsoil pits were much alike in the three villages. Most of them were approximately circular at top and bottom, but in each village some were elliptical. At the Humphrey and Great Oasis villages most of the pits were wider at the bottom than at the top, though walls of some pits were vertical, whereas at Cambria, straight-walled pits were more numerous than those which were widest at the base.

Dimensions of pits fell within the following ranges: diameter, 2.0–5.4 feet at Humphrey, 1.7–4.6 feet at Cambria, 2.3–4.3 feet at Great Oasis; depth below subsoil, 0.5–4.1 feet at Humphrey, 0.44–2.55 feet at Cambria, 0.36–1.9 feet at Great Oasis. At Cambria, five of the pits were cut through a stratum of gravelly subsoil to a stratum of white sand beneath. In each village, many pits, particularly the shallowest ones which may have been dug for fireplaces, contained ashes. In others, ash accumulations occurred at the base, part way up, or at the top, indicating they had been used as fireplaces after they were partially or completely filled with refuse. As usual, the pits were richer in refuse than was the area above subsoil. In each of the villages there were a few double pits, resulting from the digging of a new pit which partially involved an older one.

ARTIFACTS OTHER THAN POTTERY

A list and a few comments will indicate the nonceramic content of the three sites.

	Humphrey	Cambria	Great Oasis
Ground stone			
Celts		1	1
Grooved mauls		3	
Sandstone arrowshaft polishers	3	45	1
Circular manos or grinding stones	1	2	
Spherical grinding stones		2	
Other grinding stones		2	
Pebbles used as pot-polishers		2	2
Anvil stones	1	1	
Spherical hammerstones	2		
Dressed catlinite objects	1	2	
Chipped Stone			
Arrowheads			
Stemmed			11
Triangular, without notches	17	41	2
Triangular, with side notches		21	
Triangular, with side and base notches		2	
Tips only		16	3
End-scrapers	14	85	20
Side-scrapers	14	23	17
Knives	23	44	11
Drills		3	1
Hoes			2
Choppers	1		1
Bone			
Bison scapula hoes	7	5	
Bison scapula hoes, paddle shaped		2	
Crook-shaped objects of bison scapulae			2
Awls			
Split bird bones	4	5	1
Bird's breast bone		1	
Ulnae of mammals	1	1	
Dense tissue of mammal bone	1	3	
Blunt-pointed implements of mammal bone		3	
Chisel of mammal bone			1
Spatula-shaped implements		4	1
Harpoon, unilaterally barbed	1	1	
Projectile point		1	
Bead of bird bone	1		
Pendant in the form of notched triangular arrowhead, with perforation near base		1	
Other objects of dressed bone	1	1	

	Humphrey	Cambria	Great Oasis
Antler			
Picks	2		
Flaking tool		1	
Dressed cylindrical section	1		
Shell			
Clam shell ornament		1	1

The number of arrowshaft polishers at the Cambria site is impressive. Without exception they are made of coarse-grained ferruginous sandstone and follow a rather definite pattern. In all specimens the length exceeds the width and the width is equal to or exceeds the thickness. The maximum width and thickness are commonly at the middle, and the most characteristic implement resembles a flat-bottomed boat with squared ends and a rocker base. The upper face is flat and has the greatest area. It is always grooved, but in some specimens one or more other faces are also grooved.

Circular manos are the familiar bun-shaped mullers.

The preponderance of stemmed projectile points at Great Oasis is in sharp contrast to the lack of them at the other sites. Significant, too, is the fact that the triangular Cambria points often have notches on the sides and even the base, a trait not found at Humphrey.

Oneota sites are noted for an abundance of end scrapers, yet these are far more numerous at Cambria than at Humphrey. However, Humphrey end scrapers are much more uniform and much better made, and they are made of better chert than are the other objects of chipped stone at that site. Almost without exception they are snub-nosed, have pointed or nearly pointed butts, and are retouched on both edges. Distinct keels are rare.

Hoes of bison scapulae are more numerous and more uniform at Humphrey than at Cambria. At both sites, the proximal end of the bone is unmodified and the spine is leveled down. At Humphrey, the distal end of the bone is cut squarely across and beveled on the dorsal face. At Cambria, the bevel is less distinct; some specimens have deep indentations in the distal edge, though these may represent breaks followed by beveling to resharpen the implement. At Cambria, two specimens, designated "paddle-shaped hoes," were found. These were made by cutting away the head of the bone, leveling down the spine, and removing most of the larger fossa to make the strips on both sides of the spine of equal width. The distal end is rounded, and the greatest width of the object is near that end. The completed artifact is paddle-shaped and symmetrical, with the base of the spine down the mid-line. At Great Oasis, neither hoes nor paddles were found, but there were two unusual objects made of bison scapulae. In each, the proximal end of the bone was removed, the spine leveled down, and the larger fossa cut away except for its distal end, which was left as a projection perpendicular to the spine. In both specimens, the proximal end was cut diagonally—to form a sharp point on one, a blunt point on the other. The function of these objects, which somewhat resemble short-handled scythes, is not known.

POTTERY

The pottery complexes of the three sites are so different that each site must be assigned to a different aspect. The vessels have very few features in common, though in each complex the characteristic form is a round-bottomed jar with constricted neck or mouth, and the principal decoration is incised or trailed lines—a feature associated with the Mississippi pattern, in contrast to the intaglio impressions of the Woodland pattern.

Humphrey, (Fig. 3, *b*)

Inasmuch as the Humphrey site of the Blue Earth focus is definitely included in the Oneota aspect, the pottery of which is well-known,[4] a detailed description of its pottery is not necessary. It differs from Orr focus pottery in the following respects: so far as can be observed, no vessels are elliptical in cross section; the handles are flush with the rim, whereas, in vessels of the Orr focus, they are commonly placed below the lip; decoration of vessels is more elaborate and ornate and stands out better by virtue of the greater depth of the trailed lines; and rims have less of the scalloped effect found in the Orr vessels, but are more frequently decorated with incised lines and punctates, particularly on the inner surfaces. Simple designs comprised of vertical parallel lines only and of chevrons in undivided areas, which are

[4] McKern, 1931, pp. 384–386.

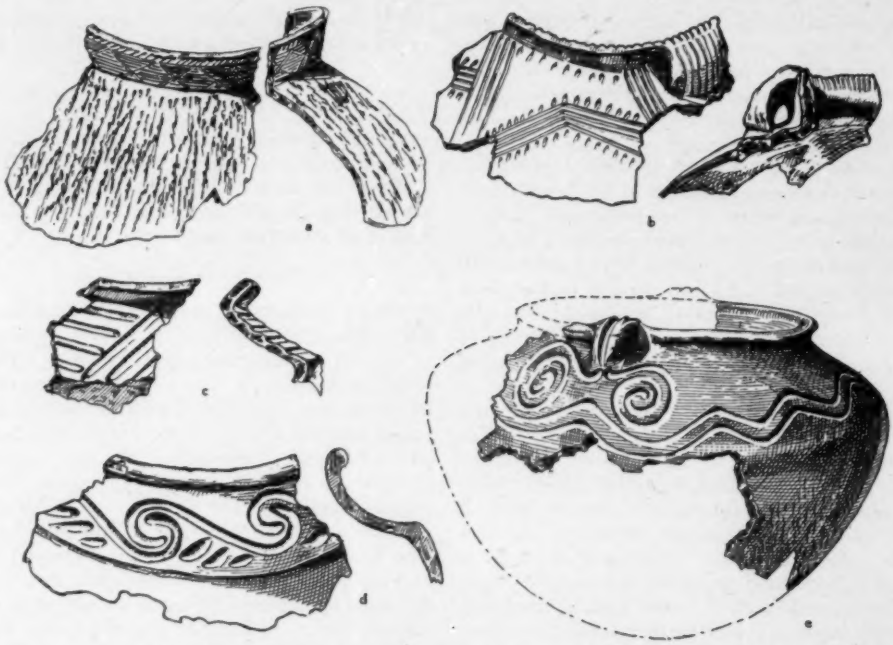


FIG. 3.—Pottery of the Mississippi pattern from Minnesota. *a*, typical Great Oasis sherd; *b*, typical sherd of the Blue Earth focus; *c*, sherd of Cambria type A with sharply angular shoulder; *d*, sherd of Cambria type C with sharp shoulder; *e*, vessel of Cambria type C with rounded shoulder. (*From drawings by John Kammerer.*)

common in Orr pottery, are present in some Blue Earth vessels, but the characteristic Blue Earth design is one in which the upper body is divided into panels by vertical bands of parallel lines, and the panels are spanned by chevrons which point up and down in alternate panels. Chevrons are commonly bordered by a row of punctates, or by a fringe consisting of a row of short vertical lines. The entire panel below the chevron may be filled with vertical lines, particularly if the chevron is an upward-pointing one.

Fifty-nine sherds, 1.6 per cent of the total, are decorated with markings of cord-wrapped paddles, but they are characteristically shell-tempered, and I believe they are Oneota sherds. Mildred Mott Wedel concurs in this belief and advises me that similar sherds have been found at other Oneota sites.[5]

Great Oasis (Fig. 3, *a*)

The pottery of the Great Oasis site requires a more detailed description, for it represents a type unlike any other in Minnesota and unlike any previously reported from other areas. Its outstanding feature is its uniformity. The paste is grit-tempered; the colors range from orange-red and brick-red through terra cotta and tan to gray and black. Vessels are globular and have a constricted throat. The neck meets the body at an angle of 90 degrees, or a little more, with the result that the diameter across the lip exceeds that across the throat, and the rim is directed outward. There is a sharp ridge or line of demarcation at the throat on the inside of most vessels. The height of the neck may be from 12–45 mm; the great majority of the necks are between 25 mm. and 35 mm. high. There are no handles.

Bodies of vessels were commonly treated with a cord-wrapped paddle. The resulting impressions surpass those usually found on Woodland sherds in uniformity of size, in regularity of spacing, and in the fineness of the cords with which they were made. Following the paddle treatment, the neck and the part of the body

[5] Letter to the author, March 21, 1942.

immediately below the neck were rubbed with a polishing stone until the paddle markings were totally or partially obliterated. Obliteration was progressively less as the distance below the throat increased. Varying degrees of polish were imparted to the areas so treated. Interiors of necks also were often well polished. It is probable that about one-fourth of the vessels were not treated with a cord-wrapped paddle, though some of these were polished. About 8 per cent of the body sherds were marked with closely spaced horizontal parallel incised lines which encircled the vessel. No one of the vessels is sufficiently complete to show whether all of the body, or only the upper portion, was so decorated.

In the decoration of the external rim area from lip to throat, the Great Oasis pottery is unique. In the characteristic sherd, this space is filled with horizontal parallel incised lines, except that in most cases a narrow band of oblique lines is found just below the lip. In a few cases the oblique lines are replaced by a row of elongated punctate impressions. Some of the sherds with the solid parallel lines and upper border have no further design, but most of them have oblique lines crossing the field of horizontal lines to form patterns. There are two principal patterns: (1) a continuous zigzag meander of a single line, or of two or three parallel lines, forming a series of triangles, and (2) two such zigzag meanders opposed to and crossing each other to form lozenges (playing card diamonds) and triangles.

An interesting group of designs is a variant of the single-band zigzag meander. In this group the area below the meander is left smooth to form plain triangles which alternate with the horizontally hatched triangles above the meander line. In some sherds of this type the triangles above the meander are hatched with oblique lines, and in one specimen they are plain, but in each instance there is a band of horizontal lines above the upper tips of the meander.

A little more than two-thirds of the rim sherds have incised-line decoration; the lines, closely spaced and accurately drawn, have a very finished appearance. The remaining rim sherds are plain, bear the incompletely obliterated impressions of a cord-wrapped paddle, or have a single row of elongated punctates at the lip.

Most of the lips are squared or flat and are not decorated, although a few bear a fine-lined crosshatch. There are no markings on the interiors of the necks.

Cambria

Cambria pottery lacks the uniformity which is characteristic of that of the other two sites and falls into at least three distinct types. The three types are grit-tempered, although 0.8 per cent of all sherds are shell-tempered.

Cambria Type A (Fig. 3, *c*)

Vessels with constricted throats and with necks whose interior vertical lines have little or no concavity are designated "type A." This is the dominant type, comprising approximately 82 per cent of the total. Bases are apparently round, and well defined shoulders relatively high on the body are characteristic. Sharply angular shoulders are slightly more numerous than rounded shoulders. The maximum width of the vessel is at the shoulder, or a little below it. The area above the shoulder is flattened in varying degrees; with rounded shoulders the line from shoulder to throat is usually slightly convex, but with angular shoulders this line may be straight or even concave. Necks are vertical or flare outward at varying angles, and the inner line of the vessel in the vertical plane may be either rounded or angularly defined at the throat. The length of the neck, which varies from 10–40 mm. by inside measurement, is directly correlated with the size of the vessel. There is also a correlation between length of neck and type of neck decoration; necks with all-over decoration have a greater average length than the others. The characteristic rim is not thickened at the lip, and the lip is usually squared, but there are exceptions. Handles are present, but they are not frequent and they do not occur on the larger vessels. Loop handles are more common than strap handles. They are paired, placed flush with the rim—to which they are welded—and terminate a short distance below the throat, where a narrowed portion of the handle pierces through, or nearly through, the wall of the vessel.

There is apparently a very wide range in size of vessels. The largest partially restored vessel has a maximum diameter of 370 mm.; the smallest restored vessel is the size of a cup.

Outside surface colors range from brick and orange reds through buff and gray to deep black, but the general impression is of dark-

colored sherds. The surface treatment of vessel exteriors and neck interiors is essentially the same as that of Great Oasis vessels, except that incised lines are not used as an all-over body decoration, and markings of cord-wrapped paddles are much less common.

Eighty-three per cent of all body sherds show no cord markings, but this group undoubtedly includes many from which the markings have been obliterated.

The chief adornment of the vessel is the decoration of the area from shoulder to throat, usually with either narrow or broad (more than 3 mm. in width) trailed lines, rarely both, and occasionally with incised lines. There are two common designs. In the first, a band of parallel horizontal lines extends downward from the throat part of the way or all of the way to the shoulder. At the base of the band there may be a row of elongated punctate impressions which are placed vertically or obliquely or, more commonly, a simple rectilinear zigzag meander. Except for the cases in which the meander becomes curvilinear because of the rounded nature of its apexes, very few curved lines can be attributed to type A vessels. In a few cases the meander line is broader than the lines of the horizontal band, and occasionally it has a fringe of elongate punctate impressions below it. The second common design is the chevron. Usually there are horizontal lines between the chevrons, and sometimes there are horizontal or oblique hatched lines within the chevrons. In no sherds do punctate markings accompany this design.

In at least forty-five sherds, punctate impressions occur within the body of the design. Such designs constitute a distinctive group, more complex than the others. Bands of parallel lines meet or approach each other at acute angles, with blank areas between, and there are punctate markings along one or both sides of the bands, either at the edge or between the last two lines of the band. Sherds of this group belong to vessels that have an unusual kind of neck decoration. Hence, though they belong to vessels that are type A in form, they may constitute a subtype because of their decoration.

Seventy-two per cent of the rim sherds have no external neck decoration, and an additional 20 per cent have only punctates or other depressions at the edge of the lip. The remaining sherds are decorated with incised lines. Half of these are a heterogeneous lot, with horizontal lines only, or both horizontal and oblique lines. The other half constitutes a uniform group, with oblique lines only. These may be parallel lines either evenly spaced or grouped in bands; or on a background of evenly spaced parallel lines there may be a second series of parallel lines, either evenly spaced to form a crosshatch or grouped to form cross bands. Without exceptions, sherds of this group have elongated punctates at both outside and inside edges of the lip and have no decoration across the lip. This group belongs with the unusually decorated shoulder sherds which it was suggested constitute a subtype.

Some form of decoration on the interior surface of the neck is found in 15 per cent of the rim sherds. It usually takes the form of a row of punctates or depressions of another sort at the edge of the lip. Incised lines are rare, but nearly one-fifth of the interior decorations are impressions of twisted cord. This is rather surprising, since such impressions are not found on neck exteriors and are rare on shoulders.

Nearly one-third of the rim sherds have lip decoration, 98 per cent of these having incised lines straight across, obliquely across, or in crosshatch. The remaining 2 per cent have twisted cord impressions.

Cambria Type B. Type B vessels are those in which the line of the neck from throat to rim is distinctly concave on the interior and convex on the exterior, forming an S-curve. That these vessels are a distinct type, and not merely a variant of type A, is shown by the fact that the outer neck surface is solidly decorated in six of the thirteen vessels represented by the twenty-two sherds, while only 8 per cent of type A sherds are so decorated. Further, this external neck decoration is made with twisted cords in three of the six vessels, whereas this type of impression is not found on the exterior surfaces of necks of type A vessels. Type B rim sherds comprise only 4 per cent of the total from the site.

It is not known whether shoulders of type B vessels are rounded or angular. Judging from the rims alone, the vessels appear to be comparable in size with type A vessels. Necks are more uniform in length and in general are shorter than necks of Type A pottery. The rims of two vessels are thickened externally above the throat to give the effect of a collar, and two others are thickened internally at the throat, thus increasing the concavity of the interior line of the neck. Paired loop handles are present.

The surface treatment of type B vessels is similar to that of type A vessels. Shoulder decorations are chevron designs made with trailed lines or lines of twisted-cord impressions. External neck decorations are made with the same kinds of lines, but twisted cord impressions are more common. Neck decorations are characteristically pseudo-chevrons placed over a background of horizontal lines. A "pseudo-chevron" is a central chevron with lines paralleling the respective sides but not meeting above it. Some vessels combine a shoulder decoration of trailed lines with a neck decoration of twisted-cord lines. Lips are often decorated with a crosshatch of either incised or twisted-cord lines.

Cambria Type C (Fig. 3, *d*, *e*). Type C vessels, which comprise 14 per cent of the total, are in some respects the most interesting feature of the site. These vessels are distinguished primarily by their form. The general appearance is such as would result if the upper body had been contracted to the mouth, with no neck, and then finished by laying a roll of clay along the upper edge of the vessel. This was not the method used, however, for broken sherds clearly show that the rim was made by rolling the edge outward and downward. Type C vessels are further distinguished by the almost exclusive use of broad trailed lines in decoration and by the very common employment of curved lines, particularly in simple and interlocking scrolls.

Underbodies are apparently rounded or somewhat conoidal. All vessels have well defined shoulders, which are usually sharply angular. Handles, more common on type C vessels than on type A vessels, are, characteristically, paired loop handles rising above the level of the rim. Some have paired protuberances, like ears, at their highest point. One is angular with a sharp point at the turn. The vessels are apparently smaller than type A vessels.

Surfaces are smoothed, and some sherds show a fair degree of polish, but at least one vessel has cord-wrapped-paddle markings, not entirely obliterated, below the shoulder. Decoration is confined to the area between shoulder and rim. The broad trailed lines are usually widely spaced, with much plain area showing, and the designs stand out boldly. The two most common motifs are the simple meander, either a zigzag in straight lines or the rounded form with curved lines, and the scroll, both simple and interlocking. Curved or straight filler lines often accompany the scroll designs, and the scroll and meander are sometimes used together.

Shell-tempered sherds were found at all levels at this site with no significant difference in their frequency. Those which can be classified by form or decoration belong to Cambria types A and C, hence I do not believe that any of them can be identified as intrusive Oneota sherds.

Intrusive Potsherds

At the Humphrey site, some grit-tempered Woodland sherds were found in a localized area, at all levels throughout the pits and elsewhere. The stratification suggests contemporaneity, but it is possible that the Woodland sherds were older and were mixed in the various levels by the Oneota people when they dug their numerous and closely spaced pits.

At the Cambria site, some Oneota sherds were found, but, inasmuch as none was found in the carefully conducted excavation by levels, no conclusions can be drawn as to their stratigraphic position.

At the Great Oasis site, fourteen Oneota sherds were found, all in the highest, or surface, level. Twenty-two Cambria sherds were found, sixteen from the highest level and six from the second level. There was none in the third level or in the pits. This stratification suggests that the Great Oasis culture is the oldest of the three.

RELATIONSHIPS

The Humphrey site belongs to the Oneota aspect, which is generally accepted as the protohistoric and early historic culture of the Chiwere Siouan peoples. At his fort on the Blue Earth River in 1700, Le Sueur was told that he was in the country of the Iowa, Oto, and Western Sioux. The villages on the Blue Earth River were abandoned before his arrival.

On the evidence of the intrusive pottery, the Great Oasis village seems to be older than either the Humphrey or Cambria sites. Such typological evidence as the preponderance of stemmed arrowheads and the lack of handles on pottery vessels strengthens this view.

Because of the evidence of a well developed agriculture, particularly the presence of storage pits, the Great Oasis culture should be classified as of the Mississippi, rather than the Woodland, pattern. There are more Woodland elements in it than in the Oneota aspect of the Upper Mis-

sissippi phase or in the Upper Republican and Nebraska aspects of the Plains Mississippi phase, though in both of those phases certain Woodland influences are present. It seems unwise at present to classify the Great Oasis aspect within either of the two established Mississippi phases of this general area—the Upper phase or the Plains phase.

Great Oasis pottery, in its tempering and surface finish, is obviously closer to Cambria type A than to Oneota pottery. It has traits in common with the Upper Republican pottery of Nebraska, which has similar temper and surface finish, and in which the external neck area is the principal decorated surface.[6] These three features are also characteristic of the pottery of the Brandon Village site,[7] which is about fifty miles southwest of the Great Oasis site. But Great Oasis pottery differs in many respects from the pottery of each of these three cultures. Its designs are essentially different, and it alone lacks handles. Cambria pottery has trailed lines as well as incised lines, and the chief decorated area is the shoulder. Upper Republican rims are characteristically collared. Brandon rims are often collared or S-shaped, and some designs are composed of impressions of twisted cord, though others consist of incised lines. Keyes advises me that one type of vessel from the Mill Creek sites is similar to Great Oasis ware, but the ceramic complex of that culture contains other types unlike Great Oasis. Apparently Great Oasis pottery has no near relatives among already defined cultures.

On historical grounds, the Cambria aspect is believed older than the Oneota aspect in Minnesota. If, in 1700, the inhabitants of the area around Mankato were Chiwere Siouan and Dakota tribes, the peoples responsible for the Cambria culture were no longer present, for the Cambria culture is clearly neither Chiwere Siouan nor Dakota.

If the Great Oasis culture is classified as of the Mississippi pattern, there is even weightier reason for including the Cambria culture within that pattern. It has some traits of each of the three phases—the Upper, Middle, and Plains Mississippi phases—but cannot be classified as belonging definitely to any one of them.

Cambria type A pottery occupies a position somewhat intermediate between Great Oasis and Oneota. It is like Great Oasis in temper and in surface finish, but it is more closely related to Oneota ware in having handles, in being decorated with trailed lines, in having the shoulder area as the chief area of decoration, and in bearing the chevron design. Although type A ware has few characteristics that are not found in Mississippi pottery as a whole, the particular combination of traits exhibited in the ware is not paralleled in any established division of the pattern.

Cambria type B pottery, though a minor element, is interesting because of the western connections it suggests. S-shaped and collared rims, decorated with incised lines, are found in the Brandon Village and in the Upper Republican and early Mandan[8] cultures. The use of twisted-cord decoration on necks is found in the Brandon Village and in all three Mandan periods. Type B pottery, together with the grooved mauls, indicates a definite western or Plains influence at the Cambria site.

Cambria type C pottery, with its angular shoulders, rolled rims, surface polish, and scroll designs, is linked with the pottery of the famous Aztalan site in Wisconsin, which is ascribed to the Middle Mississippi phase.[9] Cambria is not a Middle Mississippi site, and type C pottery is not Middle Mississippi pottery, for it is grit- rather than shell-tempered. It cannot, therefore, be considered intrusive, but it represents so strong an Aztalan influence as to suggest a partial contemporaneity of the two sites. The Middle Mississippi influence is further shown in the notched triangular arrowheads, especially the specimens with basal notches. Middle Mississippi influences have already been noted in the pottery of other cultures in this general area. Wedel finds such influences in the Nebraska aspect;[10] Griffin finds them in the Mill Creek culture and attributes them to the Aztalan and Cahokia foci.[11] Cambria may have been a link between Aztalan and the area of the Mill Creek culture in northwestern Iowa.

If the chronological relationships inferred for the three sites under discussion are correct, the Mississippi pattern in southern Minnesota presents a sequence of cultures paralleling the sequence now generally accepted in the states to

[6] Strong, 1935, p. 247.
[7] Over and Meleen, 1941, pp. 20–31.
[8] Will and Hecker, 1944, pp. 46–69.
[9] Barrett, 1933, pp. 322–335.
[10] Wedel, 1943, pp. 213–215, 222.
[11] Griffin, in Over and Meleen, 1941, p. 42.

the south and southeast of Minnesota. This sequence is:

1. The Great Oasis aspect, in which Woodland influences are prominent.
2. The Cambria aspect, showing definite Middle Mississippi influences from the east and less pronounced influences from the Plains area of the west.
3. The Oneota aspect of the Upper Mississippi phase.

BIBLIOGRAPHY

BARRETT, S. A.
1933. *Ancient Aztalan.* Bulletin of the Public Museum of the City of Milwaukee, Vol. 13.

MCKERN, W. C.
1931. "Wisconsin Pottery." *American Anthropologist,* Vol. 33, No. 3.

OVER, W. H., AND E. E. MELEEN
1941. *A Report on an Investigation of the Brandon Village Site and the Split Rock Creek Mounds.* University of South Dakota Museum, Archaeological Studies, Circular No. 3.

STRONG, W. D.
1935. *An Introduction to Nebraska Archeology.* Smithsonian Miscellaneous Collection, Vol. 93, No. 10.

WEDEL, W. R.
1943. *Archaeological Investigations in Platte and Clay Counties Missouri.* U. S. National Museum, Bulletin 183.

WILL, G. F., AND T. C. HECKER
1944. "Upper Missouri River Valley Aboriginal Culture in North Dakota." *North Dakota Historical Quarterly,* Vol. 11, Nos. 1 and 2.

WILFORD, L. A.
1941. "A Tentative Classification of the Prehistoric Cultures of Minnesota." AMERICAN ANTIQUITY, Vol. 6, No. 3.
1942. "Minnesota Archaeology: Current Explorations and Concepts." *Proceedings of the Minnesota Academy of Science,* Vol. 10.

University of Minnesota
September, 1944

THE NORTH BENTON MOUND: A HOPEWELL SITE IN OHIO

WILLIS H. MAGRATH

THE NORTH BENTON MOUND is a Hopewell site located in Mahoning County, northeastern Ohio. This mound is on the farm of Mr. John Malmsberry, near the village of North Benton. Mr. Roy Saltsman and the writer participated in the excavation of the site. The photographs and other records were made by the writer.[1]

The recent history of the mound is interesting. The grave of Judge William Smith, original owner of the mound, was placed some seven or eight feet north of the crest. It is shown in the cross section (Fig. 4). When Smith died in 1837 with the strange request that he be buried in the mound, the top was apparently cut off to make a burial platform; the removed dirt which was thrown down upon the south shoulder is represented on the projected cross section by broken hatching. The mound, situated on a high knoll, later became an even more conspicuous landmark when conifers were planted on it and grew to great size.

Then, about 1930, the year of the North Benton centennial, the mound was subjected to further modification. The conifers, now dead, were removed, and the top was cut down two or three feet more to make a platform suitable for public speakers, band rehearsals, and the like. The grave of Judge Smith, with its monument, remained however. The judge's remains were removed during the mound exploration, reburied on another part of the farm, and the monument re-erected. The mound was now reduced to an elevation of about six feet, measured from the surrounding field—seven and a half feet if

[1] Valuable guidance was received from the staff of Mount Union College, particularly from Dr. Joseph M. Scott, in bone structure, and Professor G. C. Lamb, in geology. Acknowledgements are made to Dr. John R. Cooper, Ohio Wesleyan University, for identification of minerals, and to Mr. Richard G. Morgan, Mr. H. Holmes Ellis, Lt. Col. Dache M. Reeves, Dr. Carl E. Guthe, Mr. W. C. McKern, Dr. Thorne Deuel, Dr. J. Alden Mason, Dr. Philip Phillips, and Dr. Alexander Wetmore for assistance in many ways. To Mr. Clyde Vannaman and other students of Mount Union College; Mr. Ernest Stanley and Mr. Beryll Hartzell of North Benton; Mr. James Magrath, Mr. William Saltsman, and Mr. W. H. Mathews of Salem, Ohio, the writer is deeply indebted for generous aid without which it would have been impossible to conduct this exploration.

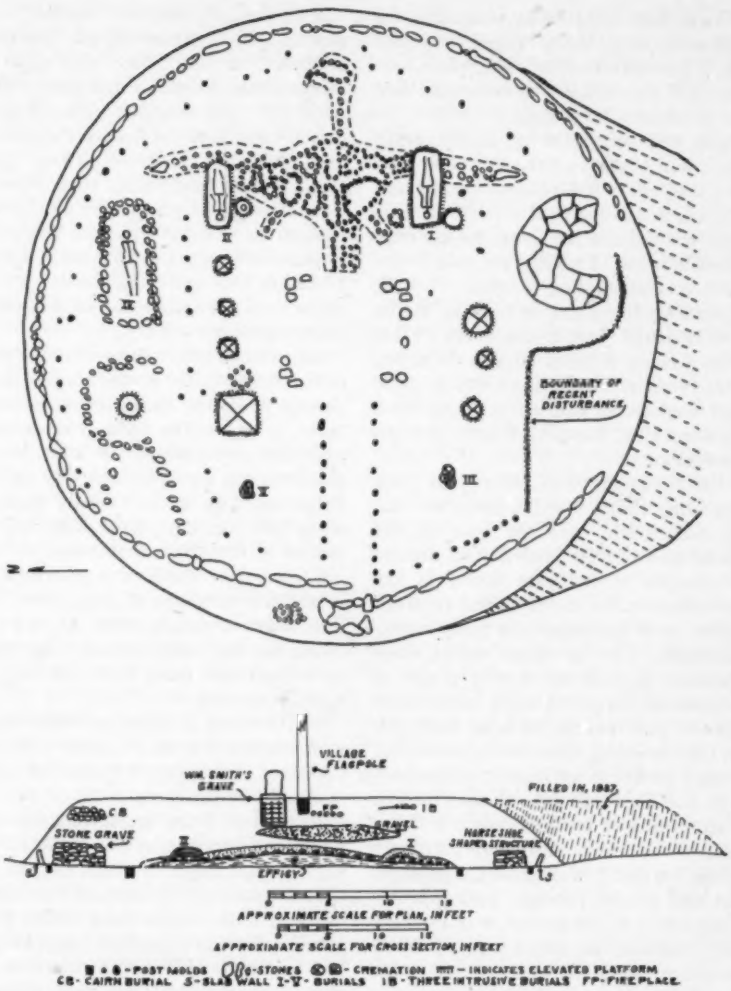

BOUNDARY OF RECENT DISTURBANCE
VILLAGE FLAGPOLE
WM. SMITH'S GRAVE
FILLED IN, 1937
STONE GRAVE
HORSE SHOE SHAPED STRUCTURE
EFFIGY
APPROXIMATE SCALE FOR PLAN, IN FEET
APPROXIMATE SCALE FOR CROSS SECTION, IN FEET
CB- CAIRN BURIAL S-SLAB WALL I-V- BURIALS IB- THREE INTRUSIVE BURIALS FP- FIRE PLACE

FIG. 4.—Plan and projected cross section of the North Benton mound.

measured from the mound floor. Luckily, the successive operations did not disturb the underlying structures.

The mound, nearly circular and 75 feet in diameter by 6 feet in height, was situated on a high knoll, a remnant of one of the terraces of the Mahoning River, a quarter mile west of the village of North Benton. The fields surrounding is had been so intensively cultivated that any signs of outer works which might have existed were obliterated. There was a slight dip toward the mound around its periphery. In past years a cache of arrow points and numerous other artifacts had been picked up on the surface of the mound and in adjacent fields. A small sector of the south side of the mound had been removed in recent years.

Excavation of the mound showed that the base had first been prepared by stripping the top soil from the knoll over an area about 80 feet in diameter. This area had then been surfaced with a deposit of sandstone rubble which

seemed to have been reduced by pounding, for small fragments were sharp edged and not waterworn. Finer material had been placed on this rubble, and the whole was smoothed and compacted to make a level floor.

Just inside the outer limits of the earth mound was a wall of stones, enclosing the whole structure. Except at a few places, where boulders were used, it was made of sandstone slabs about 2 feet wide and 4 feet long, set on edge and joined end to end. On the west side of the mound there was an opening through the wall, made by running the north semicircle of the wall inside the south. Just to the north of this opening was a cairn of small stones. Attached to the outer member of the gate was a stone cist about 2 feet across and 2 feet deep, lined with impervious clay. Nothing was in it when it was uncovered.

Within the encircling wall there were post molds, suggesting that a wooden structure had previously been built over the floor of the mound. Some molds were distributed around the outer margin, others were found in the center. In diameter, the molds varied between 4 and 8 inches, with the larger size predominating. Occasionally, two or three molds close together seemed to indicate that a group of posts had taken the place of a single large pillar.

Two lines of post molds, running from the opening in the encircling stone wall toward the center, seemed to define an inner corridor; between them, the floor was smooth and packed hard. No structures or burials were found between these lines of post molds, lending support to the assumption that it was, in fact, a passage. At the east end of this passage, and approximately in the center of the mound, was a square area, about 12 feet across, which seems to have been a fireplace, since it was covered with abundant ashes and charcoal and the ground was burned to a brick red color for a depth of 8 inches. Three small boulders at each corner appeared to define the limits of the fireplace.

Opposite the corridor and on the east side of the fireplace an effigy of an eagle with spread wings covered the floor. This was nicely molded from puddled clay mounded to a height of about 8 inches above the floor. Slabs of white sandstone, which covered nearly every part of the figure, formed a complicated mosaic of conjoined circles, contrasting with the darker material of the floor. From wing tip to wing tip the eagle measured 32 feet, while from head to tail it was approximately 16 feet.

Platforms ("crematory basins," "altars") of puddled clay contained both cremated and uncremated burials. There were eight such platforms about 14 inches high, four south and four north of the fireplace. The large platform directly south of the fireplace supported an unusual multiple cremation. Three layers of calcined bones alternated with layers of fine, clean, river sand which were evidently intended to keep the remains separate. The large pedestal to the northwest of the fireplace, approximately 20 inches wide and 3 inches deep, contained the remains of a number of individuals, perhaps a dozen, perhaps twenty.

An extended burial was found over each wing of the eagle. That to the south (Burial I) appeared to be the burial of an extremely large male, lying on the back, with arms and legs extended and head to the west, it rested on a platform made of puddled clay approximately 14 inches high and evidently made after the effigy had been completed, since the stones and outline of the effigy were found underneath the platform. The burial was completely enclosed in a thick envelope of fine, clean, river sand. The massive bones were in extremely poor condition, but observations suggested that the individual was more than normally large and heavily muscled.

North of the skull was a circular hearth, 2 feet wide, outlined with boulders 6 to 8 inches in diameter and reddened by fire; two of them had been split by the heat.

At the feet of the burial were the fragments of a purposely broken human skull, the prominent supraorbital ridges of which suggest that it was that of a male. In the area of the chest no traces of collar bone or ribs were found, but four objects lay here in a position suggesting that they had been on the chest of the individual. The first was a limestone platform pipe, about 2¾ inches long, with a plain bowl; a portion of each stem was broken off. The platform of this pipe was definitely keeled; a cross section would be V-shaped instead of rectangular. A flake knife and two copper ear spools with twine-wrapped spindles were also found on the chest. Fragments of a material which appeared to be birchbark were clinging to one of the spindles, suggesting that the body had originally been covered with birchbark. It is worthy of note that birch does not grow at the present time in this locality.

To the south of the head, a clay pedestal supported an offering of four stone celts (the largest 9 inches long) which were of exceptional beauty

and color. The second largest of these celts, with a pointed, wedge-shaped poll, was finely polished and its midsection was intentionally scarified to aid retention in the haft. No similar celt could be found in any of the collections from this vicinity which were examined by the writer. The other two celts were smaller and of a common form.

It is interesting to note that offerings in groups of four occurred twice with this burial, first, the offerings on the chest, and again, the offering of celts near the head. This number occurred again and again throughout the mound; sometimes there were four similar objects, as with the celts, at other times, there were four dissimilar objects, but in every case except one, the offerings occurred in groups of four.

On the north wing of the effigy, in a position similar to that of the male burial, lay a skeleton (Burial II), also on a platform of clay, extended on the back with head to the west. The skeleton, perhaps of a woman, was about 5 feet 11 inches tall. She had been buried in an envelope of clay so tough as to suggest that it may have been worked into a plastic mortar before being laid down. It was nearly as hard as plaster of Paris and resisted the trowel at every stroke. When finally the clay shell was removed, a well preserved skeleton was revealed.[2] The teeth indicated that the individual had died in early life. Evidences of disease were apparent in some bones. Particularly pronounced were evidences of erosion of the periosteum of the long bones, especially the femora, and perforated lesions of the glabella.

Accompanying the burial were groups of artifacts, all close to 14 inches above the floor. Near the right ankle were four exquisite flake knives, laid out in an orderly row. Three of these were from the same glassy red and white banded jasper core. Near the feet was a cache of deer antler awls. A slender piercing implement of drab flint which lay by the left hip is finely flaked, about 3 inches long by ¼ inch wide, and not notched.

Close to the right shoulder was a most unusual object, a hollow copper ball about the size of a tennis ball, made of two strong copper hemispheres neatly flanged together. One hemisphere had a double perforation, possibly for attachment to a staff, for sherds of material showing the definite grain of wood were found clinging to the holes. The seam had sprung apart, probably due to the pressure of the earth, and a quantity of dirt and small stones had entered; the pebbles seemed hardly large enough for rattle stones.

At the feet, and also inside the clay envelope, was another of the singular deposits of hacked-up skulls. Some of the fragments of this deposit were large enough to permit determination of the part of the skull represented, but most of the skull had been beaten into pieces too small for recognition. Even teeth had been split and broken in the demolition. A count of teeth, made as completely as possible, indicated that at least two skulls had been destroyed in making this offering.

Burial III lay to the west of the southerly line of cremations. The bones suggested that the body had been that of a child of some four or five years of age. The remains were in an extremely poor state of preservation except in the area of the chest, where a part of the burial had been preserved by contact with a fine breastplate of twelve-gauge copper 5¾ inches wide. As may be seen from the illustration (Pl. V, *c*), it is shaped like a hoe blade, and perforated for suspension, with a thong still in place. A copper axe, shown in Plate V, *b*, lay on the chest beside it. Beneath the breastplate and axe, the body-wrappings were perserved, the outermost layer consisted of matting, and within this there was a shroud of twined-woven cloth covering an inner shroud of buckskin which was as fine as chamois. Although the body-wrappings had been preserved, there was no trace of the axe handle.

Burial IV lay in a stone grave, extended on the back with the right hand on the chest, the left on the stomach, and the head to the east. Near the head was a sandstone slab bearing on one side a natural formation which looks like the Chinese character "ta." The stone grave itself, which is of a type of construction unique in Ohio, had been built to the west of the north wing tip of the effigy, with its long axis in an east-west line. A row of post molds between this grave, on the one hand, and Burial II and the north row of cremations, on the other, may mark the line of a former wall. The grave was built of field stones and blocks of sandstone. There were no openings in the wall, except for two to be described later. The construction was so solid that the main portions were still

[2] In a mound near Brownsville, Ohio, excavated by Mr. Ray LePage in 1936, the single burial, that of a large male, was encased in a hard shell of material resembling fire clay. The shell could hardly be broken with the fingers.

standing after literally hundreds of sight-seers had clambered into and out of it. Outside measurements show a length of 11 feet and a width of 6 feet. When found, the stones that originally covered the grave were on the bottom, covering the burial, with slabs standing on edge between the capstones and the wall of the grave. Cyrus Thomas has referred to beehive vaults covering graves in mounds.[3] It may be that this structure was corbeled and that, because of improper support, the covering had fallen in. The slabs found on either side of the covering slabs at the bottom of the grave appear to have been corbeling tiers which were not strong enough to support the weight of the superincumbent earth. The structure did keep the soil from the burial, for, when the stones were removed, the skeleton lay exposed on a bed of clean, fine, river sand. The evidence seems to indicate an attempt at corbeling, since the stones of the upper tiers overlapped the lower ones to a certain extent. There was evidence that a large fire had burned inside the tomb after it had been completed. After the grave had been excavated, two holes through the east wall were noted, one on each side of the place where the head had been. At this point the wall measured nearly 18 inches in thickness; the tunnels, which were perfectly straight, could not have occurred except by design. Whether they were intended for the insertion of offerings after the vault was closed, or whether they were designed to facilitate the movements of the soul, is a question that cannot be answered.

The crushed skeleton beneath the stones was apparently that of a very old man, judging by the condition of the bones and teeth. The molars had been worn down nearly to the alveolar process, which exhibited pathological erosion strongly suggestive of marginal pyorrhea.[4]

Among the remains of the fingers of the right hand, resting on the chest and surrounded by a mass of bright red paint, was a "conjoined tube," consisting of three parallel cane tubes encased in a copper jacket. The whole is 6 inches long and 2 inches wide, the individual canes having an interior diameter of ⅝ inch. One side of the copper jacket is corrugated, conforming to the shape of the canes, the other is flat, with the copper overlapping in the middle. Inspection of the interior of the tubes revealed that plugs, probably of leather, had been placed inside at varying distances from the ends to produce three closed columns of air of graduated lengths. Probably this instrument was a panpipe.

The left hand, lying on the stomach held an unusual object. It had evidently been a hollow tube of wood about 6 inches long, ¾ inch in diameter at the small end, and expanding to more than in inch at the other end. A silver sleeve 2 inches wide enclosed the narrow end, and five petal-shaped inlays of silver graced the wider. The crushed wooden shell could not be preserved, but the silver elements were recovered intact. Its purpose can scarcely be conjectured. It is large for a smoking tube, furthermore the wood was only ⅛ inch thick, which seems hardly enough to withstand the heat of burning tobacco. However, a tube of this size, if fitted with a reed at the smaller end, is capable of producing ear-splitting sounds, as can be learned from a trip to any well-stocked toy shop. The only other object found with the burial was an arrow point of smoky quartz.

Burial V, situated north of the corridor and west of the fireplace, was a bundle burial of an adult. The bones were not in their normal relationship, and the skull was missing. Flakes of verdigris, but no artifacts were noted.

To the west of the great stone grave and north of Burial V was a curious enclosure made of laid-up stone which formed a wall 3 feet high, with an opening on the south toward the central corridor. In the center of this enclosure was a clay pedestal, about 14 inches in height and somewhat wider, which held a strange offering. Before the offering was laid on the pedestal, either a fire was kindled on its top or ashes were placed on it. Red paint was spread to a depth of about half an inch over the ashes. This, in turn, was topped by a bundle of triangular sheets of mica on which four smashed copper earspools were placed, outlining a quadrangle 5 inches square. Inside this quadrangle was a residue of wood, so badly decayed as to defy identification except where copper salts had preserved one portion which seemed to represent the neck and head of a bird or serpent, with the eyes formed by tiny white inlays that may have been seed pearls. Outside of the quadrangle of earspools were four objects of cannel coal, also placed in a neat square. Two of these were gorgets; they were broken, perhaps ceremonially. One of the remaining two articles was

[3] Cyrus Thomas, *Report on the Mound Explorations of the Bureau of Ethnology*, Bureau of American Ethnology, Twelfth Annual Report, 1894.

[4] Dr. J. B. Wilkinson of Alliance, Ohio, called the writer's attention to this condition.

an oblong unperforated object about the size and shape of a domino; the other was long, narrow, and thin, with one side brought to a double-concave bevel. This latter was about 10 inches long and an inch wide. Two sizeable nuggets of galena lay in the rotted wood, and a residue of white powder indicated the location of a number of others which had disintegrated. Upon the offering of nuggets, smashed earspools, and other objects was a second bundle of a half-dozen mica sheets. The entire offering was covered with red paint which reached a thickness of ½ inch near the middle. Over the paint was a layer of light-colored material which may have been ashes. Near the edge of the offering, but outside it, were two arrows and a fine flake knife, perhaps thrown in at random at a later time. Nothing else was found in this room.

The last feature to be uncovered was a horseshoe-shaped structure with walls of dry-laid masonry, measuring 12 feet around the outer wall and 2½ feet in height. The walls were like those of the great stone grave but the space between them was solidly filled with tamped-down clay which was then paved over with stone blocks averaging a foot square. The center slab, much larger than the others, measured nearly 2 feet on a side. Upon it, and partially upon the adjacent slabs, was a crust of brilliant red paint, together with fragments of human skulls. Two mastoid processes, a supercilliary ridge, many fragments of teeth, and unidentifiable chips were noted in the debris. Some of the fragments had been driven down into the interstices between the slabs. Abrasions on the sandstone indicated that the instrument that had been used to break up the skulls was probably an axe. There seems hardly any doubt that the offerings of broken skulls found at the feet of Burials I and II had first been smashed on this strange platform.

The hard interior of this structure was broken up and put through a screen, but no artifacts were found, nor was there any sign of human remains. Neither inside the structure nor anywhere within a 6-foot radius was anything found except the skull fragments already noted. It was simply a semicircular platform of laid-up stone, built for breaking up skull offerings.

GENERAL REMARKS

In the course of excavating the mound, no evidence of stratification was noted, nor was there any trace of a "primary mound." Basket-loads of earth were piled up over the whole area until the mound had reached a height of 4 feet, at which point glacial gravel was dumped at the center of the growing pile. This gravel is not found near the site, but it occurs in vast quantities about four miles to the westward. A lens-shaped deposit of the gravel, 12 feet in diameter and about 18 inches thick, was built up over the middle of the mound and was covered by mound earth. About a foot above this, a fireplace 3 feet in diameter and outlined with small boulders was prepared. In this, a final fire was burned; but no gifts were offered, unless they were perishable, for only ashes and charcoal were found. Following this, the mound was carried to completion without further special features, at least in the portions of the original structure which remained at the time of our excavation. Whether another gravel layer may have occurred in the portion that had been previously removed could not be determined.

Two intrusive burials were found in the body of the mound itself. The first of these was a cairn burial on the north slope of the mound. There were no artifacts within the cairn, and the bones were almost completely disintegrated. The second, also a cairn burial, was on the west slope. In the grave were found the skeletons of a man, a woman, and a child, placed so closely together as to suggest that they had been in a common bundle. A single arrowhead accompanied the remains. A number of artifacts that appear to have been accidental inclusions were taken from the mound dirt. These include some forty perfect arrow points, many fragments of arrow points, flake knives, cores, broken slate ornaments, a cut bear tooth, an unidentified hematite artifact shaped like a shallow spoon, a polished diabase sphere 1¼ inches in diameter, copper beads, a slate smoking tube, and other miscellaneous objects. Many of these objects were either burned or broken or were both burned and broken. All the arrow points were stemmed, many having a peculiar characteristic—a stem equal in length to the rest of the projectile. Not a sign of pottery was found, although all workers were urged to be on the lookout for sherds and a special reward was offered to the finder of the first piece. Carbonized nutshells were the only remains of edible material uncovered. Many carbonized chips of wood were preserved; they were cut through as neatly as if they were the products of a metal axe.

Quantities of charcoal were found, most

abundantly near the floor and along the lines of post molds, as would be expected if the structure once supported by the posts had been burned down upon abandonment. It is worthy of note that no charcoal was found in contact with the effigy nor with any of the burials or offerings. In the writer's opinion, these had rereceived a preliminary covering of earth before the final destruction took place. It seems almost a foregone conclusion that if the structure had been set afire and the burning timbers had been allowed to come crashing down upon a structure as frail as the effigy, extensive damage would have resulted; but this was not the case.

CONCLUSION

The North Benton Mound, which we have called the Temple of the Effigy, shows strong Hopewell influence, but it is different from Hopewell in many of its traits. This situation would be explicable either by the fact that the builders were a proto-Hopewell group or by the fact that they were a divergent group which developed a culture complex of its own.

The diagnostic traits of the North Benton Mound appear to be as follows:

1. A floor effigy of clay topped with stone mosaic.
2. Offerings of smashed skulls at the feet of burials, perhaps an indication of human sacrifice.
3. Horseshoe-shaped altar with debris of broken skulls and red paint.
4. Absence of offerings with cremations.
5. Unusually tall platforms with great uniformity of level of all offerings and burials.
6. Burial envelopes of sand or puddled clay, but no trace of log crib tombs or so-called "primary mounds."
7. Apparent ritualistic use of the number four, expressed in the number of offerings.
8. Offerings placed directly on the chest.
9. Total absence of squares, circles, parallel walls, graded ways, or other forms of earthwork usually associated with Hopewell sites.

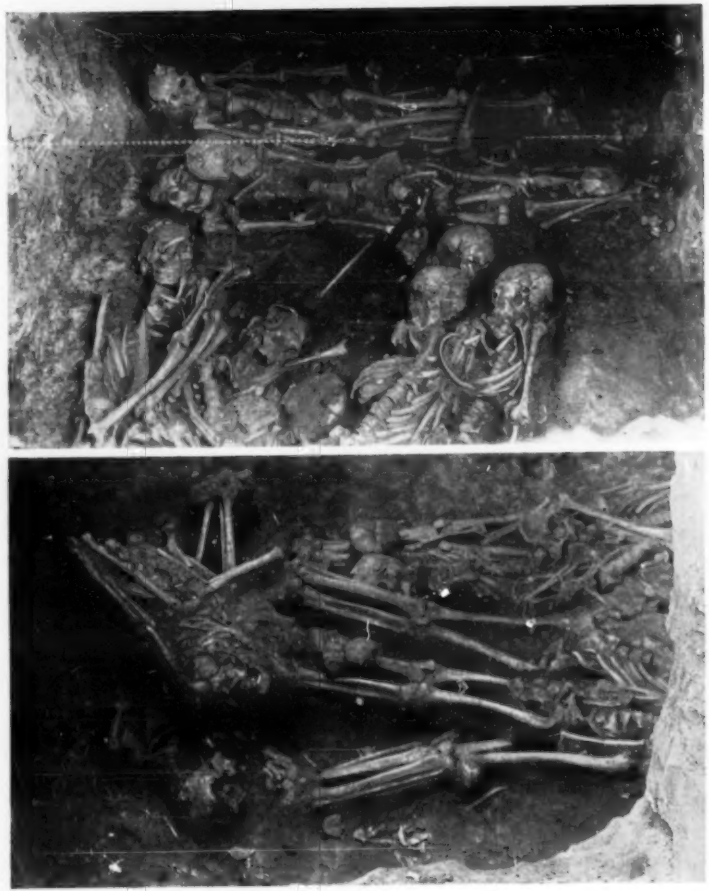
Dr. L. W. King, of Salem, Ohio, was kind enough to make spectroscopic examinations and resistance tests of the copper from the mound. A spectroscope with a 16,500-line, reflection-type grating was used for the examination. The copper was found to be free of any metal that would act as an alloy; not even silver was present. Samples taken from the axe and samples of chemically pure copper (C.P. Cu), according to the spectrographs, compare favorably in purity. In order to obtain further data, the axe was tested for electrical resistance with A.C. voltages up to 25,000. It was found that the resistance of a strip of the bit extending back $\frac{1}{4}$ inch from the cutting edge differed from that of the rest of the axe. It was impossible to draw an arc from the cutting edge; the spark invariably emerged from the metal at a point about $\frac{1}{4}$ inch away from it. This has been interpreted as an indication of an alteration of the molecular structure of the edge, perhaps as the result of hammering and annealing.

I should like to venture an opinion with reference to this: The edges of prehistoric copper axes may have improved by the introduction of minute particles of silicon. It is pretty well agreed that these axes were cold hammered, in all probability with a quartz hammer or cobble. The process would result in a continual abrading of the striking surface of the hammer, and the detached particles would tend to become imbedded in the somewhat plastic copper. Gritty dust would also collect on the anvil and be driven into the copper from below. The amount thus introduced into the thin edge might be considerable. Now silicon, as is well known, is practically a non-conductor, and we find that the silicon lines are well represented in the spectrograms.

Alliance, Ohio
November, 1940[5]

[5] Although Mr. Magrath's revised manuscript was received in November, 1940, subsequent delays in preparing it for publication have been beyond the control of either Mr. Magrath or the editor.

The North Benton Mound. *a*, the conjoined tubes from Burial IV; *b*, celt, and *c*, breast plate, from Burial III; *d*, limestone pipe from Burial I; *e*, hollow copper ball from Burial II; *f*, portion of effigy, showing Burial II and cremation on platform at head of burial; *g*, the foot of the stone grave.



Box Elder Mound, *Left*, opposite ends of the burial vault (From University of Illinois negatives J2 and J3); *upper right*, Woodland Plain, Illinois Hopewell Variant; *lower right*, Hopewell Plain, rocker-stamped vessel.

THE BOX ELDER MOUND IN LA SALLE COUNTY, ILLINOIS

JAMES B. GRIFFIN

EXCAVATIONS carried on in 1931 under the University of Illinois archaeological program were directed by A. R. Kelly. One of the small mounds explored during the spring of that year was excavated by W. V. Kinietz. It was called the Box Elder Mound and was located near the town of Science, in Starved Rock State Park near Utica, La Salle County, Illinois.[1]

During the summer of 1935 I was permitted by the late F. C. Baker, then Curator of the Museum of Natural History of the University of Illinois, to study and describe this material. The vessels to be described below are a part of the collections of the University of Illinois.

The Box Elder Mound is one of a fairly large number of Hopewellian mounds in the northern Illinois Valley, almost all of which are small dome-shaped structures, each with a sub-floor pit. It had a diameter of 50 to 55 feet and was from 2 to 2.5 feet high. Excavation was hindered by a box elder tree, 4 feet in diameter, which grew above the central grave, and by the fact that part of the mound had been used as a foundation for a house and an elevator.

Near the center of the mound was a rectangular sub-floor pit approximately 6 feet wide by 8 feet long, with its long axis oriented roughly north and south. The pit extended 2 feet below the original ground surface. According to Kinietz, the first burials were placed on the yellow clay subsoil and were covered with 2 to 4 inches of blue-black soil. Then a second layer of burials was placed in the pit and covered with 6 inches of the same distinctive dark soil. Finally, a single skeleton, accompanied by two pottery vessels, was placed in the grave. A third vessel is mentioned in Kinietz' notes, but I have no record of it. Apparently no other artifacts were with the burials.

Along one end of the pit, and parallel to it, were four adult burials fully extended in a dorsal position, two of them lying upon the others. The skeleton of a child lay extended on its back, with its lower extremities on the pelvic regions and its head at the feet of the pair of adults nearer the center of the pit (Pl. VI, *upper left*). At right angles to this group were the extended burials of at least five adults with their crania toward the five extended burials just described. From the photographs of the excavations, it is apparent that there were at least six other extended burials. In addition, there were bundle burials or burials of even less complete skeletal fragments in the grave (Pl. VI, *lower left*).

The presence of a special soil covering the bodies in a sub-floor burial pit is a constantly recurring trait in Hopewellian sites of the northern Illinois Valley. This was noted at some length in Kelly's general statement on the University of Illinois excavations[2] and is mentioned in my brief description of the Utica Mound group.[3] It has also been described for the Adler site near Joliet.[4] The presence of the rectangular pit in sites in central Illinois is recognized, in *Rediscovering Illinois*,[5] as a distinctive Hopewellian trait, but the use of a foreign dark soil to cover the bodies is not so listed. Apparently this is not as common in areas south of Peoria. Copena, in northern Alabama, is another cultural division in which a sub-floor pit and special earth to fill the grave are reported.[6] The sub-floor pit is an outstanding characteristic of some mounds of the Trempealeau focus,[7] of the majority of those of the Goodall focus,[8] and of some of the Adena mounds in Ohio and Kentucky, where the use of foreign soil to refill the pit has been reported.[9]

The two vessels from this site preserved at the University of Illinois are interesting examples of two divergent types. The first of these is representative of the Illinois Hopewell variant of Woodland Plain (Pl. VI, *upper right*). The tempering material, crushed granitic rock, comprises approximately $\frac{1}{4}$ to $\frac{1}{2}$ of the volume of the paste. The texture is medium coarse. The hardness of the exterior surface is 2.5. The color of exterior and interior surfaces is a dull gray with irregular blackened areas. Surfaces are roughly smoothed, and there is no decoration. The lip is flattened and slopes toward the interior. This

Box Elder Mound, *Left*, opposite ends of the burial vault (Pl. VI, *lower left*). *Right*, Illinois Hopewell Variant; *lower right*, Hopewell Plain, rocker-stamped vessel.

[1] See map in Griffin and Morgan, 1941, p. 4.

[2] Kelly and Cole, 1931, pp. 326–327.

[3] Griffin and Morgan, 1941, p. 44.

[4] Krogman, 1931, p. 417.

[5] Cole and Deuel, 1937, p. 222.

[6] Webb and De Jarnette, 1942, pp. 303–304.

[7] McKern, 1931, pp. 236–238.

[8] Quimby, 1941, pp. 139–142, 151.

[9] Webb, 1942, p. 339.

is a dominant trait of much of the pottery which belongs to the Hopewellian phase in the Middle West. The rim is vertical for a short distance below the lip. The vessel is cup-shaped with a slightly flattened base. The height is 12 cm. and the lip diameter is 13 cm. The width of the lip is 7 mm., while the rim is 6 mm. thick.

The second vessel (Pl. VI, *lower right*) differs in almost every character except the use of grit for tempering. At the time this vessel was examined, I was not fully aware of the significance of the presence of limestone as the tempering medium in northern Hopewellian vessels of this class. For that reason, it is not certain that this small jar has limestone temper, but the presence of small cavities visible on the surface in the photograph suggests that this is the case. The texture is medium fine and the hardness of the exterior surface is 2.5. The exterior color is red to gray-brown.

The exterior surface was well smoothed before decoration was placed on the body and rim. The outer rim has an incised, fine-line, cross-hatched design 1.5 cm. wide. At the base of the rim there is a horizontal row of closely spaced hemiconical punctates made from the left. The lower rim is a plain, polished horizontal band 1.6 cm. wide the lower border of which is defined by a narrow, deep, horizontal incised line. Completely covering the body are eight horizontal rows of vertically oriented plain rocker-stamp impressions. These are not separated into zones by incised lines. An overall, plain, rocker-stamp pattern like this is relatively rare on such expertly made vessels.

The lip is flattened and slopes inward, and the rim is vertical. The body is almost oval in horizontal cross section, and the base is circular and flattened. The least and greatest diameters at the lip are 8.6 and 11 cm., and at the base of the rim they are 8.4 and 10.6 cm. The short diameter of the body is 10.5 cm., the base diameter is 5 cm., and the height is 12 cm. Both lip and rim have a thickness of 5 mm., while the unusually thin body is but 2.5 mm. thick.

These data are presented to augment the scanty information now available on Hopewellian sites of the northern Illinois Valley. The fundamental relationship between Woodland pottery and Hopewellian pottery in the area north of latitude 33° has been recognized by most authorities.[10] The vessels associated here do no violence to this association.

[10] For example, see McKern, 1931, p. 239.

BIBLIOGRAPHY

Cole, Fay-Cooper, and Thorne Deuel
1937. *Rediscovering Illinois; Archaeological Explorations in and around Fulton County.* University of Chicago Press.

Griffin, James B., and Richard G. Morgan, eds.
1941. *Contributions to the Archaeology of the Illinois River Valley.* Transactions of the American Philosophical Society, n. s., Vol. 32, Pt. 1.

Kelly, Arthur R., and Fay-Cooper Cole
1931. "Rediscovering Illinois." *Blue Book of the State of Illinois*, 1931–1932, pp. 318–341.

Krogman, Wilton M.
1931. "The Archaeology of the Chicago Area." *Transactions of the Illinois State Academy of Science*, Vol. 23, pp. 413–421.

McKern, W. C.
1931. *A Wisconsin Variant of the Hopewell Culture.* Bulletin of the Public Museum of the City of Milwaukee, Vol. 10, No. 2.

Quimby, George I., Jr.
1941. *The Goodall Focus.* Indiana Historical Society Prehistory Research Series, Vol. 2, No. 2, pp. 63–161.

Webb, William S.
1942. *The C. and O. Mounds at Paintsville.* University of Kentucky Reports in Anthropology and Archaeology. Vol. 5, No. 4.

Webb, William S., and David L. DeJarnette
1942. *An Archaeological Survey of Pickwick Basin in the Adjacent Protions of the States of Alabama, Mississippi and Tennessee.* Bureau of American Ethnology, Bulletin 129.

Museum of Anthropology
Ann Arbor, Michigan
April, 1944

HORIZON STYLES AND POTTERY TRADITIONS IN PERUVIAN ARCHAEOLOGY

GORDON R. WILLEY

THE PRESENT paper is partially devoted to a consideration of the concept of "horizon styles"[1] in Peruvian archaeology: how the concept has been used in archaeological reconstruction, and how new styles are in the process of formulation. It includes also an analysis of several ceramic periods which may be grouped into such a horizon style, the White-on-red. Differing from the horizon style is another historical phenomenon which I have called the "pottery tradition." An attempt is made here to show the relationship of these two concepts—horizon styles and pottery traditions—as they are exemplified in Peruvian archaeology.[2]

HORIZON STYLES

The increasing importance of the horizon-style concept in Peruvian archaeology has been emphasized by two recent summary papers. Bennett[3] has outlined the position and significance of the Chavín horizon style, giving a new and formal recognition to the status of Chavín as a widespread cultural influence, a status first claimed for it by Tello, the Peruvian archaeologist. In a long survey and general critique, Kroeber[4] has brought together the accomplishments and summarized the status of Peruvian archaeology as of 1942. In this study, Kroeber frequently uses the concept of the horizon-style. He defines more clearly the styles now used by most Peruvianists and suggests others which might be usefully extended as horizon markers. He defines a horizon style as ". . . one showing definably distinct features some of which extend over a large area, so that its relations with other, more local styles serve to place these in relative time, according as the relations are of priority, consociation, or subsequence."

In greater detail, the archaeologist, in his use of the term "pan-Peruvian horizon style," has reference to certain art influences which are registered in the technologies of ceramics, stone carving, architecture, textiles, and metalwork, resulting in an artistic similarity in products from different regions. These horizon styles serve as index markers for interrelating sequences of various local cultures in the Peruvian archaeological time scale. There are, at present, three commonly accepted horizon influences in central Andean archaeology. The earliest is the Chavín. This style, in its different manifestations, has been placed at the very bottom of the column in the relative chronology of Peru. Chavín-like periods are, by stratification or on the basis of association, the earliest cultural periods in a number of local sequences, both on the coast and in the highlands. The second pan-Peruvian horizon style is the Tiahuanaco, or Tiahuanacoid. Its position in the sequence is later than that of the Chavín horizon, from which it is separated by a major time interval known as the Early Period. The horizon of Tiahuanaco influences is often referred to as the major Middle Period of Peruvian archaeology. The first half of the subsequent Late Period is dominated by the emergence of many local styles; the latter half is marked by Inca influences. These Inca influences, found in almost all sections of the central Andean area, compose the third horizon style.

It seems likely that other styles exist which could, like the three already defined, facilitate comparison of local sequences. Kroeber[5] has tentatively proposed three new horizon styles: Negative painting, Nazca B-Y, and White-on-red. All three are represented principally in ceramics. Future archaeological research in Peru and attempts to use them as horizon markers will ultimately test their validity as true horizon styles. It is possible at this time, however, to inquire into the limitations and specifications of the horizon-style concept as it has been used, and to see how Negative, Nazca B-Y, and White-on-red compare to Chavín, Tiahuanaco, and Inca as tools for archaeological reconstruction.

Two simple criteria are fundamental to the horizon style; first, that there shall be resemblance among the style groups so classed; second, that there be uniformity in relative position in

[1] A term recently coined by Kroeber. See Kroeber, 1944.

[2] The writer is grateful to Drs. A. L. Kroeber, W. D. Strong, W. C. Bennett, and Julian H. Steward for reading and commenting upon the manuscript of this paper.

[3] Bennett, 1943.

[4] Kroeber, 1944.

[5] *Ibid.*, pp. 108–111.

the sequence on the part of the style as it occurs from region to region. Resemblances among component regional styles of a horizon style are established on the basis of very definite sets of features. Chavín has a number of specifically distinctive traits. These include a variety of representations of a single cat-god theme with diagnostic treatment of eye, tooth, and claw. The style is massive, curvilinear, and highly symbolic. Designs are executed in a sculptural, carved, or incised technique in stone, bone, and pottery. Tiahuanaco and Inca features are as distinctive as those of Chavín, if not more so. Tiahuanaco representations of the humanized god or demon follow a very set pattern. The rectangular head and stiff body and the similar treatment of eye and mouth are uniformly repeated on the coast and in the highlands. Inca pottery decorations and forms are also unmistakable in any context. The small, stylized, brightly painted geometric patterns and the specific aryballoid jar form are part of a complex of features that make up an exceedingly serviceable historical unit.

Horizon-style resemblance, although specific, does not indicate cultural identity of the groups who participated in the style. This is clear from the three horizon styles now generally accepted. For example, while the pottery of Chavín de Huántar and the Ancon shell heaps is strikingly alike, and both sites manifest the Chavín horizon style, the first is a megalithic center of outstanding architecture and stone sculpture, while the second is a medium-sized coastal village with no elaborate stone masonry or monuments. Similarly, while the majority of Middle Period pottery styles of the north, central, and south coasts have little resemblance to each other, and while their immediate histories are divergent, all are, nevertheless, influenced by Tiahuanaco stylistic features.

A cross check on the uniformity of relative position in the sequence on the part of any one horizon style is made possible by the fact that there is more than one such horizon in Peruvian archaeology. If only one series of horizon influences appeared in the different local sequences, the synchronization of these sequences would be difficult to establish; but, with three strong horizon influences linking regional sequences, the placing of intervening localized styles and periods is not only made easier, but the chronological position of any one of the horizon styles can be partially verified by reference to the other two.

A preliminary evaluation of Kroeber's three projected horizon styles in terms of the above criteria raises some interesting problems. Of the three styles—Nazca B-Y, Negative, and White-on-red—the first would appear to possess the greatest number of distinctive features for determining similarities or dissimilarities to other styles. That is, Nazca B-Y is intrinsically, in terms of its design elements, motifs, and colors, a more complex and easily recognizable style unit than either Negative or White-on-red. Nazca B-Y styles are known principally from the Nazca-Ica area on the South Coast, but some examples of Nazca B-Y influences have been found on the central coast, as well as on the extreme south coast down to Camaná.[6] Tello has long maintained that a style closely related to Nazca B-Y is characteristic of the highland Chanca country. Kroeber's recent illustrations[7] of a collection from Ayacucho tend to confirm this extension of Nazca B-Y style into the highlands. Unfortunately, Nazca B-Y influences cannot be placed in any sequence in the highlands or on the extreme south coast. In the Nazca-Ica area, its pre-Tiahuanaco to Tiahuanaco position is well substantiated from the point of view of associations, although not confirmed by stratigraphy. Cross ties with Early Lima (Nievería) of the central coast strengthen the case for Nazca B-Y as a horizon marker, but, as Kroeber points out, general lack of sequence data makes it impossible to use the style yet as a widespread time marker.

The possibility that White-on-red painted ceramics may be used as a horizon indicator has been briefly touched upon by Bennett[8] and Kroeber.[9] The following section includes an analysis of some of the several White-on-red styles of Peru and an attempt to relate them in a horizon style. The problem of a Negative-painted horizon will be treated subsequently.

WHITE-ON-RED

Distribution. The first White-on-red style was discovered by Uhle (1908) at Cerro Trinidad, site E, in the Chancay valley on the central coast.[10] My own excavations in 1941, at the same site and at Baños de Boza, also in the Chancay, added new descriptive and stratigraphic data on the Chancay White-on-red style.[11] A few evidences of this type of White-on-red were also found by Strong and Corbett

[6] *Ibid.*, p. 110. [7] *Ibid.*, p. 99, Pl. 39.
[8] Bennett, 1944, pp. 98–99. [9] Kroeber, 1944, p. 110.
[10] See Kroeber, 1926, for details. [11] Willey, 1943.

in their stratigraphic excavations at Pachacamac, a little farther south on the coast.[12] Shortly before this, Rafael Larco Hoyle published discoveries of another White-on-red ceramic style on the north coast, some 300 miles above Chancay.[13] He has named this style Salinar, after the large type-site cemetery in the Chicama valley.[14] In the northern highlands, Bennett found still other variations of White-on-red pottery in intrusive graves at Chavín de Huántar and in isolated sites near Huaraz.[15]

Time Position. One of the factors most strongly suggesting a relationship among the widely separated occurrences of certain White-on-red pottery is the uniform position of the style in sequences in which it occurs. On the central coast, Chancay White-on-red is, by sound inference, later than the Ancon-Supe shell-mound periods, which are a part of the Chavín horizon [16] Chancay White-on-red is followed, at both Pachacamac and Chancay, by the Interlocking and Early Lima periods, central coastal cultures of the major Early Period. On the north coast, according to present evidence, Salinar White-on-red follows Cupisnique, a coastal Chavín period, and immediately precedes Mochica (Early Chimu), the classic style of the north coast during the Early Period.[17] In the northern highlands, White-on-red graves are intrusive into, and later than, highland Chavín materials. Although the isolated Huaraz graves neither directly confirm nor deny this position in the sequence, Bennett is of the opinion that Huaraz White-on-red is pre-Tiahuanaco. There is, then, a very good chance that the Huaraz finds are as early as Chancay White-on-red or Salinar.

Chancay White-on-red. Pottery of the White-on-red style from the Chancay valley is of medium quality as to ware and firing, and is dull red in color. It is apparently handmade, and a high percentage has a red slip. Principal forms of vessels are low, open bowls; mammiform jars or canteens; double-spouted jars with flat bridge handles; single-spouted jars with attached flat handles; deep, wide-mouthed jars; and crudely modeled bird-effigy vessels with spout and flat handle attached. Exterior surfaces of the various forms of jar and exterior and interior surfaces of open bowls are painted with broad white zones or with simple and poorly executed arrangements of lines, dots, and geometric figures. Red decoration is occasionally superimposed upon the white zones. Effigy vessels and small modeled *adornos* attached to vessels are occasionally emphasized by incised as well as white-painted decoration.

Chancay stone beads are uncarved spheroids. Shell beads are common, and shell inlay work in stone was practiced. Hammered gold ornaments were known at this time in the Chancay valley, and a fragment of copper, or of a gold-copper alloy, has also been found.

Chancay burials are flexed and buried in rather simple graves. Huge potsherds and rocks were used to build a cover for the body.

Salinar.[18] The Salinar pottery of the northern coast is moderately well made and, like the pottery of Chancay, is usually oxidized in firing so that the natural color is a dull red. A small percentage of the wear is, however, black or dark brown. In variety of forms, skill in modeling, and even in some of the painted decorations, Salinar is decidedly superior to Chancay White-on-red. There is, though, a marked similarity in the simply conceived and clumsily executed white-painted decoration of both styles. The predominant vessel forms are: single-spouted jar with flat handle; unhandled vessels, including deep, wide-mouthed jars with short, projecting collars, bowls with incurved rims, and shallow open bowls; figure vessels, including stirrup-spout, figure-and-spout, and spout-and handle variations. Figure vessels usually have an animal, bird, or human figure on top of, or as a part of, the vessel to which the spout and handle are attached. The figure-and-spout form has a flat bridge-handle connecting the modeled figure to the spout. Decoration is characteristically of broad white lines and is often composed of simple geometric arrangements such as pendant triangles filled with marks or dots. On some vessels the spout is surrounded by a ring of white S-shaped elements. Occasionally, painted areas are outlined with fine incised lines, and incision is sometimes employed, in addition to white paint, on modeled figures. A few vessels have impressed nodes attached to the exterior surface as ornamentation.

[12] Strong and Corbett, 1943.

[13] Larco Hoyle, 1941.

[14] Larco Hoyle presents a more detailed summary of the Salinar culture in a paper now in press (*Handbook of South American Indians*, Vol. 2, Bureau of American Ethnology, Smithsonian Institution).

[15] Bennett, 1944.

[16] Strong, 1925; Kroeber, 1925; Willey, 1943.

[17] Larco Hoyle, 1941.

[18] See Larco Hoyle, 1941; Kroeber, 1944.

The stirrup-mouthed jar seems to be a local feature of Salinar White-on-red, just as mammiform jars and double-spouted jars with flat bridge handles appear to be restricted to Chancay White-on-red and to early cultures of the south coast. On the other hand, the single-spout jar with attached flat handle is an important connective trait common to Salinar and Chancay White-on-red. It should be noted that this feature is not present in Chavín, Cupisnique, Mochica, or Early Nazca. Apparently Salinar, Chancay White-on-red, and the negative style of Gallinazo on the north coast are the only styles previous to the Middle Periods for which the single spout and flat handle are recorded.

Salinar pottery can be related to the periods which precede and follow it within its own area. In the stirrup-mouth and in figure modeling it resembles both coastal Chavín Cupisnique and Mochica. In its predominantly red color and in the combination of red and white it is closest to Mochica.[19] However, Salinar is significantly unlike both Cupisnique and Mochica in its flat-handle single-spout jar and its figure-and-spout forms. In general, the Salinar style looks like the product of a combination of White-on-red influences of a simpler sort—such as those revealed in the ware of the Chancay valley—and a Cupisnique strain. On stylistic grounds, Salinar pottery could very easily occupy the position transitional between Cupisnique and Mochica to which Larco Hoyle has assigned it.[20]

Salinar lacks most of the carved stone and bone objects in whose production the craftsmen of the Cupisnique period excelled. Salinar beads are much like those of the Chancay White-on-red period. Work in shell, rare or absent in Cupisnique and abundant in Mochica, is found in moderate quantities in Salinar. A similar situation exists in regard to metalwork. No metal objects have been found associated with Cupisnique in the Chicama region. On the other hand, Mochica metalwork is plentiful and embodies advanced techniques of casting, soldering, and gilding with gold, silver, copper, and alloys of these. Salinar graves have yielded simple hammered and openwork gold ornaments and, in addition, some evidence of soldering. As in the Chancay White-on-red horizon, one tiny copper fragment has also been found.

Cupisnique burials are usually flexed in simple oval graves; those of Mochica are carefully extended upon the back in stone- or adobe-lined rectangular graves. Salinar burials appear to be intermediate in type, for they are only slightly flexed, grave excavations are longer than those of Cupisnique, and bodies are often protected by stone slabs.

White-on-red Pottery from Chavín de Huantar. Pottery from intrusive graves at Chavín de Huántar has a general resemblance to the Salinar and Chancay White-on-red styles. In its extremely simple vessel forms and painted decorations it is more like Chancay than Salinar. Specific forms, like the small, shallow bowl painted with pendant triangles filled with dots, are the closest ties to Chancay.[21]

White-on-red Pottery from Huaraz. Pottery from the isolated graves near Huaraz, while not definitely placed in the general Peruvian sequence, is most probably antecedent to the Middle Period. The Huaraz finds show a number of similarities to coastal White-on-red. These include various open bowl forms, a single spouted jar with a flat handle, and a double jar with bridge handle connecting a head-and-spout. Plain red, plain brown, and White-on-red vessels were associated in the same grave. The style of white painting is comparable to that of the coast. The style which Bennett considers subsequent to Huaraz White-on-red is the Wilkawain-Tiahuanaco, whose closest affinities are with Early Lima and Middle Ancon I (Tiahuanacoid) of the central coast.[22]

Summary of White-on-red. The various White-on-red styles discussed thus far fit rather well into a uniform time horizon for a large part of Peru. On the north coast, the White-on-red of Salinar is intermediate between Cupisnique (coastal Chavín) and Mochica. On the central coast, Chancay White-on-red is subsequent to the local Chavín style—the Ancon-Supe shell mound cultures—and precedes the Interlocking and Early Lima periods. In the northern highlands, a White-on-red style follows the Chavín period at Chavín de Huántar and probably precedes the Wilkawain-Tiahuanaco Middle Period, as suggested by the data from Huaraz. There is, then, a strong probability that a major White-on-red ceramic style, made up of historically related and coeval components, marks a general time level between the close of Chavín and the beginnings of the great Early Period

[19] Kroeber, 1944, p. 59.

[20] Larco Hoyle, 1941, pp. 249–251.

[21] Bennett, 1944, p. 92.

[22] *Ibid.*, pp. 36, 98–99.

cultures such as Mochica, Early Lima, and Early Nazca.

The case for a White-on-red horizon style is not as strong typologically as it is sequentially. That is, the fact that White-on-red ceramics appear at particular, and corresponding, points in a number of culture sequences in Peru strengthens the possibility that their various occurrences are historically related. The painting of simple geometric and curvilinear figures in white on a red-fired ground does not make up a stylistic complex as definitive as Chavín, Tiahuanaco, Inca, or Nazca B-Y. The addition to the complex of other features, such as distinctive vessel forms, does, of course, make for somewhat greater security in the establishment of cross-identifications from region to region. Personally, I feel that the component White-on-red styles discussed comprise such a horizon style. It is admitted, though, that without the accompanying sequence data the emergence of such a new horizon style would be greatly obscured.

One of the principal reasons for this obscuring of the early White-on-red similarities is that there are several Peruvian styles other than those mentioned which utilize simple white decorations on a red ground. The two of these which most closely resemble Chancay and Salinar White-on-red are the White-on-red styles of Middle Supe[23] and Middle Ancon.[24] Both of the latter are much later than the proposed early White-on-red horizon, belonging in the major Middle Period bracket. Kroeber also illustrates a new White-on-red style from the region north of the Chicama valley.[25] This pottery is not placed chronologically, but the chances are it belongs to the Middle Period or to the Late Period. Finally, there is Mochica, which is dominated by a White-on-red, or white and red, color combination. Actually, none of these later White-on-red styles bears a very detailed typological similarity to early Chancay, Salinar, or northern highland White-on-red, yet there is just enough resemblance to give room for speculation concerning possible relationships.

POTTERY TRADITIONS

These speculations concerning the relationships of the later White-on-red styles to the earlier component styles of the White-on-red horizon lead us to wonder if there are not other widely inclusive historical units of an order different from that of the horizon style. It appears certain that the Peruvian Andes and coast were a unified culture area in that the important cultural developments were essentially local and basically interrelated for at least a thousand years. This fundamental cultural unity justifies seeing ceramic developments in terms of long-time traditions as well as coeval phenomena. The concept of a pottery tradition, as used here, includes broad descriptive categories of ceramic decoration which undoubtedly have value in expressing historical relationships when the relationships are confined to the geographical boundaries of Peruvian-Andean cultures. The pottery tradition lacks the specific quality of the localized pottery style, and it differs from the horizon style in that it is not an integration of artistic elements which has been widely diffused at a given time period. A pottery tradition comprises a line, or a number of lines, of pottery development through time within the confines of a certain technique or decorative constant. In successive time periods through which the history of ceramic development can be traced, certain styles arose within the tradition. Transmission of some of these styles during particular periods resulted in the formation of a horizon style; other styles in the continuum of the tradition remained strictly localized. The distinctions between a horizon style and a pottery tradition should be kept in mind, as the two are opposable concepts in archaeological reconstruction. Attempts to use what are probably pottery traditions as style markers for specific time horizons has caused some misunderstanding in Peruvian archaeology.

The later White-on-red styles of Middle Supe, Middle Ancon, North Chimu, and Mochica are quite probably all a part of a greater historical unit which encompassed northern Peru for several centuries. Thus, while they are not a part of the early White-on-red horizon style, they make up, together with the component parts of this horizon style, the North Peruvian White-on-red pottery tradition. From post-Chavín times up to the Inca conquest the White-on-red tradition was expressed through various styles on the northern and central coast and in the northern highland. Kroeber indicated this continuity a number of years ago when he said, regarding White-on-red elements in Middle Supe, ". . . whether the simple white-

[23] Kroeber, 1925, p. 242.
[24] Strong, 1925, pp. 154–152.
[25] Kroeber, 1944, p. 74 and Pl. 36, D–F.

on-red designs in the San Nicolas collection can be regarded as partly due to central (coastal) influences or as wholly derived from Epigonal, the strong inclination to a red ware and a red ground does seem likely to be due to the survival of old ceramic habits of the central coast."[26]

The beginnings of four other pottery traditions can be separated out of the broader currents of Peruvian prehistory prior to the crystallization of such styles and cultures as Mochica, Early Lima, Early Nazca, and Classic Tiahuanaco. All four traditions, as with White-on-red, are represented both on the coast and in the highlands at an early date, and, because of this, it is difficult to determine their centers of origin. Two of the four, along with White-on-red, appear to be north Peruvian; another, south Peru-Bolivian; while the fourth cannot be localized even to this extent.

The North Peruvian Incised tradition has, perhaps, the earliest origin of all. It is associated with highland Chavín and Cupisnique in its earliest known stages. This tradition of ceramic decoration continues on into periods much later than those of the Chavín horizon. An example of such survival is found in the incised and punctated ware of Middle Ancon I and Teatino, in the Chancay valley. In fact, Tello has classified Teatino incised as Chavín.[27] However, the Teatino and Middle Ancon I incised pottery is significantly different from that of coastal Chavín, lacking as it does the distinctive symbolic stylizations of the cat motif and other elements of the Chavín horizon. Similarly, Cerro Sechin pottery[28] does not seem to be very Chavín-like, but it certainly could be included in the larger scope of the Incised tradition. It is further suggested that the black incised wares of Late Chimu and those associated with the Inca styles are, at least partially, outgrowths of the North Peruvian Incised tradition.

Another important line of ceramic development is the North Peruvian Plastic tradition embracing the sculptured and modeled styles, particularly of the northern coast. Considerable antiquity is also indicated for this tradition. It appears first in the Chavín-Cupisnique style of the coast. The essential quality of this tradition is that plastic expression is not limited solely to appendages or *adornos*, for the sculptor's medium is the entire vessel, which is made to conform to the desired representation. The Plastic tradition is represented by only an occasional fragment in the Chavín levels of the northern highlands. Theories concerning cultural similarities between the highlands and coastal Chavín are based upon comparisons of the stone sculpture only of Chavín de Huántar with the ceramics of Cupisnique. Of all the pottery traditions, the North Peruvian Plastic appears easiest to place as to its general region of origin, presumably the valleys of the northern coast.

The Plastic tradition reached its artistic climax on the northern coast in the well-known Mochica style. After a temporary obliteration of the tradition in the Moche-Chicama sector during the Middle Period, it again found expression in Late Chimu and in other styles of the far northern coast. In tracing the history of the Plastic tradition, or of any other pottery tradition, it is not implied that such significant styles as Mochica or Chimu were the products of unilinear development wholly within any one tradition. There is every indication that these styles are the results of the blending and merging of traditions. Mochica and the subsequent Chimu styles, must be an outgrowth of the Plastic, Incised, and White-on-red traditions; perhaps other, unrecognized, strains, which could be considered traditions in the same sense as the three named, are also represented.

A fourth pottery tradition may, tentatively, be called the South Peru-Bolivian Polychrome tradition. It is possible that multicolor painting is as old in the south as sculptured and incised pottery is in the north.[29] It certainly has a long history there. On the coast it runs from Paracas Cavernas through Nazca, Epigonal, and the Ica series; in the highlands it has beginnings at least as far back as Classic Tiahuanaco and Pucara and is still present in Inca. All of these wares are distinctly different at the level of style, yet all share the emphasis on color. Throughout the tradition there runs a definite trend toward reduction in the number of colors used.

Negative-painting is the fifth pottery tradition. It has been referred to above as a tenta-

[26] Kroeber, 1925, p. 243.
[27] Kroeber, 1944, p. 45.
[28] *Ibid.*, Pl. 22.
[29] Paracas Cavernas, generally conceded to be the earliest ceramic style of the south coast, is multicolored and incised, although the incising is not as vigorous a feature of the decoration as in Chavín. An early connection between the Chavín style and Paracas Cavernas has been suggested by various authorities.

tive or projected horizon style, and possibly it is, at least within the Peruvian-Andean culture area. Kroeber has remarked upon the inconsistencies in its relative position in the various sequences. Negative is earliest in the south, where it is associated as a minority type with Paracas Cavernas. On the central coast it is presumably slightly later, occurring in association with Chancay White-on-red and Interlocking. In the north, Gallinazo Negative is considered by both Bennett and Kroeber to be just post-Mochica. In the northern highlands it is most strongly represented in the Recuay style, which is pre-Tiahuanaco; however, in the same region it continues in the subsequent Wilkawain-Tiahuanaco period.[30] Moving from south to north, then, we find negative-painted pottery occurring in increasingly later associations, although, unlike the other traditions, it does not continue through to the Conquest period. If all negative-painted pottery is accepted as being stylistically related, Negative then becomes the only horizon style which has a markedly diagonal sequence distribution on the Peruvian time chart. Such a distribution is possible for a horizon style; in fact, it is probable that the other horizon styles were not absolutely coeval in all parts of Peru. However, the time-chart device has been artificially arranged to place Inca, Tiahuanaco, and Chavín on horizontal levels, ignoring the factor of time lag. In view of this, one would expect other horizon styles to be consistent with these horizontal arrangements. The suspiciously great amount of time lag which Negative shows, in a supposed south-to-north diffusion, leaves room for doubt as to whether it is a reliable horizon marker.

There seem to be only two principal Negative styles or types, a two-color and a three-color. The two-color has the wider distribution. It is virtually always a buff or orange color and the paint, or dip dye, is a shade of maroon, brown, or black. Designs are usually composed of very simple elements. Virtuosity in Negative is limited to the Recuay pottery of the northern highlands. This ware has more complicated decorations. The slip is often white, the designs are blocked out in black dye, and a red pigment is applied positively. In general, from the stylistic point of view, Negative forms a tighter unit than the somewhat amorphous White-on-red. Undoubtedly the negative, or resist-dye, technique of painting pottery is a historically diagnostic trait; but, on the other hand, the results of this technique may be limited in range. At least, most South American, and even New World, negative painting is similar in appearance, suggesting that the number of designs easily rendered in the negative technique is not great, a factor to be considered in the determination of historical relationships.

Thus, although this is far from proven, it is suggested that the historical unity expressed in the sum total of Peruvian negative painting could best be conceived of as a pottery tradition rather than as a horizon style. When larger samples of negative-painted pottery are available from more locations within Peru it may be demonstrated that certain stylistic divisions within the Negative compose horizon styles.

CONCLUSIONS

The value of the established horizon styles in Peruvian archaeological syntheses is obvious. The horizon styles are the horizontal stringers by which the upright columns of specialized regional development are tied together in the time chart. Although important revisions are to be expected in Peruvian archaeology, it is safe to say that these horizon markers will remain as a part of any revised reconstructions. This seems assured for widespread stylistic influences, such as Inca, Tiahuanaco, and Chavín. Tentative horizon styles, such as the White-on-red, will be accepted, reformed, or disregarded as investigation proceeds.

The utility of the concept of a pottery tradition is yet to be tested. Awareness of the continuity of basic techniques and habits in all or a large part of the central Andean area through a very long range of time would seem to have the specific, if negative, value of emphasizing the point that generic similarities in decoration and form of ceramics do not necessarily indicate stylistic complexes diffused rapidly through space in a relatively short period. A study of the interplay of pottery traditions and styles should explain more fully the various historical factors which have converged in time and space to produce the entity of the style.

Horizon styles have been interpreted functionally as well as having been used for historical reconstruction. Inca and Tiahuanaco style expansions have been considered results of specific types of sociological and political phenomena. For Inca, it is known that cultural influences were carried by force of military

[30] Bennett, 1944, p. 106.

conquest and political incorporation and colonization. The spread of Tiahuanaco and Chavín might possibly be attributed to such mechanisms, but there are, of course, other processes which would also serve to disseminate technical and artistic ideas. The cultural processes involved in the rise and persistence of pottery traditions throughout the several centuries of Andean development is an equally fascinating subject for the student of culture history. The long opposition of the northern Peruvian wares, which emphasized the plastic and the simple color combination of White-on-red, against the pottery of the south, which stressed multiple color, demonstrates the staying power of certain regional-cultural ideas; but, for the present at least, it tells us little else.

Such regional persistence of ceramic traditions is a common occurrence in many places throughout the world. The northern black-on-white and southern red-and-buff wares of the North American Southwest are good examples. In regard to the eastern United States, Linton has recently written of what might be called the northern Woodland pottery tradition of pointed-bottom vessels and roughened surfaces, and has suggested a theory relative to the functional determinants underlying its origins and long persistence.[31]

[31] Linton, 1944, pp. 369–380.

BIBLIOGRAPHY

Bennett, W. C.
1943. "The Position of Chavín in Andean Sequences." *Proceedings of the American Philosophical Society*, Vol. 86, No. 2, pp. 323–327.
1944. *The North Highlands of Peru, Excavations in the Callejón de Huaylas and at Chavín de Huántar.* Anthropological Papers of the American Museum of Natural History, Vol. 39, Pt. 1.

Kroeber, A. L.
1925. *The Uhle Pottery Collections from Supe.* University of California Publications in America Archaeology and Ethnology, Vol. 21, No. 6.
1926. *The Uhle Pottery Collections from Chancay.* University of California Publications in American Archaeology and Ethnology, Vol. 21, No. 7.
1944. *Archaeology in Peru in 1942.* Viking Fund Publications in Anthropology, No. 4.

Larco Hoyle, Rafael
1941. *Los Cupisniques.* Lima, Peru.

Linton, Ralph
1944. "North American Cooking Pots." American Antiquity, Vol. 9, No. 4, pp. 369–380.

Strong, W. D.
1925. *The Uhle Pottery Collections from Ancon.* University of California Publications in American Archaeology and Ethnology, Vol. 21, No. 4.

Strong, W. D., and John M. Corbett
1943. *A Ceramic Sequence at Pachacamac.* Columbia Studies in Archeology and Ethnology, Vol. 1, Pt. 2.

Uhle, Max
1908. "Über die Frühkulturen in der Umgebung von Lima." *Sixteenth International Congress of Americanists*, Vienna, 1908, pp. 347–370.

Willey, Gordon R.
1943. *Excavations in the Chancay Valley.* Columbia University Studies in Archeology and Ethnology, Vol. 1, Pt. 3.

Bureau of American Ethnology
Smithsonian Institution
Washington, D. C.
May, 1944

FACTS AND COMMENTS

THE DE LUNA EXPEDITION AND SOUTHEASTERN CEREMONIAL

James B. Griffin, in his recent paper, "The De Luna Expedition and the Buzzard Cult in the Southeast,"[1] advances the hypothesis that the ceremonial material characteristic of such mound sites as Etowah, Georgia; Moundville, Alabama; and Spiro, Oklahoma, is the result of proselytizing efforts of escaped Mexican Indian servants imported with the De Luna Expedition (1559–1561). He states that "the De Luna Expedition might well have furnished the impetus that resulted in the adoption in the Southeast of various Mexican art styles and concepts."

This question is of course a basic one in Southeastern archaeology. These Mexicanoid elements are graphic focalizations of a cult which swept over the Southeast from the Gulf of Mexico to the Great Lakes and from the Plains to the Atlantic. Taken at face value, this hypothesis of Griffin's is a simple tool for explaining the otherwise puzzling stylistic resemblances between Southeastern ceremonial art and the Mixteca-Pueblo "culture" of Mexico. When one attempts to make archaeological and historical fact jibe with this hypothesis, however, he encounters difficulty. In Georgia, a state where one of the great ceremonial concentrations is found, archaeological data indicate an earlier introduction and a longer duration of the cult than are allowable by Griffin's dates.

We take exception to Griffin's statement that "recent archaeological activity in the Southeast has demonstrated rather clearly that this particular cultural manifestation is almost certainly post-De Soto." As a matter of fact, cult elements are first seen in Georgia in the intrusive Middle Mississippian complex at the Macon Site. This complex is foreign to the indigenous Georgia levels and is so typical of early Middle Mississippi that it has been said that "the Indians buried at Macon were probably born on the Mississippi River." The second period in which elements appear is represented by Mound C at Etowah and by the basal mount at Hollywood, in Richmond County, Georgia. This was the period of greatest elaboration. The best evidence indicates that at Etowah cult elements are found in a context which represents a fusion of the earlier indigenous population with an intrusive Middle Mississippian group. In the subsequent cultural period, Lamar cult elements are scarce. When they do occur, they show neither the elaboration nor the stylistic assurance seen in the preceding period, and they appear only on a small range of ceremonial objects—gorgets, pipes, and water-bottles. The Lamar Period was followed by Ocmulgee Fields. No cult elements have been found archaeologically in this last horizon.

Fortunately we can date these last two periods with fair accuracy. English trade material indicates that the Ocmulgee Fields Period falls between the dates 1690 and 1715. The end-date is accurate, since both historic sites on which material is found are well documented and are known to have been abandoned during the Yemassee War and not reoccupied.

There was an earlier period of contact on the coast, however. During the greater part of the time between 1560 and 1670, the Georgia coast was the scene of repeated attempts by the Spanish to establish missions. Fortunately, fragments of olive jars attributable to this interval have been found in indisputable contact with pottery of the Lamar complex. We know, therefore, that the Lamar complex was well developed by the end of the first quarter of the seventeenth century at the latest.

If the De Luna Expedition were the source of the cult, we would have narrow limits indeed between which to place an impressive amount of cultural development. We must assume that in a period certainly not exceeding seventy-five years in length the imported Mexicans learned the native language, that they elaborated the cult and that it spread to the Mississippi Valley without spreading into Georgia. In this period there was a movement of Middle Mississippian groups, which introduced the cult into Georgia. One of these groups established a large fortified ceremonial site at Macon. Within the same seventy-five years, they reached an understanding with the indigenous population and finally amalgamated with some of them. It was after this amalgamation that the most brilliant florescence of the cult took place. The cult center of Etowah, with its huge central mound containing 4,500,000 cubic feet of earth, was built. This phase passed and the cult declined. We find evidence of the first contact on the Georgia Coast after the subsequent Lamar period was well advanced. It is clearly too much to expect that all these events could have taken place within a span of seventy-five years or less.

It seems well to point out, in addition, that De Soto's narrators refer to material which appears to belong to the cult in question. They describe wooden eagles with gilded eyes, mortuary temples, and mounds with ramp approaches used as substructures for caciques' houses. They also describe the ceremonial use of the cross, the dominant motif of the cult. It seems likely, therefore, that the complex was firmly entrenched and possibly on the decline a good twenty years before the arrival of the De Luna Expedition.

In conclusion it may be said that the cult is first seen as an importation into Georgia in a Middle Mississippian context, that it reaches historic levels only in a degenerated form, and that in all probability it was functioning in Georgia for a long period of time. It seems impossible to explain the presence of this material by the De Luna Expedition.

It might be pointed out that this material cannot be used, as Bennett and others have used it as an arbitrary time-marker meaning "post 1540." The irresponsible use of guess-dates serves to confuse a subject which is quite complicated enough without any outside assistance.

RE "BUZZARD CULT"

In recent articles dealing with the Southeastern United States, the term "buzzard cult" has been used frequently and in all seriousness to refer to the ceremonial complex characterized by eagle and serpent representations, the cross, sun symbols, the forked eye, the tasseled baton, embossed copper plates, and other motifs and ceremonial objects. It is true that the phrase "buzzard cult" has had a certain currency in conversation during the last few years. This fact is no justification for its use in print, however, and it is indeed distressing to see anthropological slang creep into the literature. If there is any demonstrable connection between buzzards and the cult complex in question, it would be well for one of the proponents of this term to demonstrate it. Otherwise the term should be abandoned altogether.

[1] *Journal of the Washington Academy of Sciences*, September 15, 1944.

Those who have used it may have had in mind the "buzzard men" of the Choctaw and the trait of fleshing the dead. This is a widespread and ancient trait in the Southeast, appearing in all levels from the Archaic to the historic and for this reason is a poor choice as a terminological handle for the cult.

In 1941 Ford and Willey used the term "Southern Cult" in referring to this material. This term is in the literature, and it has the value of being noncommittal. I should urge that it be used until further functional studies of the material suggest a more appropriate one.

ANTONIO J. WARING, JR., 1st Lt., M.C.
Washington, D. C.

RECENT WORK ON EARLY MAN AT THE GRUTA DE CADONGA IN THE ARGENTINE REPUBLIC

INTRODUCTION

Numerous finds of human skeletons and artifacts in Argentina, all buried in soft deposits, have led to a large literature and to controversies over the antiquity of man. Investigations of these finds by Hrdlička[1] and the geologic work of his companion, Bailey Willis, proved: (1) that all the skeletons are those of *Homo sapiens;* (2) that many occur close to the surface in material subject to recent slumping and wind action; (3) that the stratigraphy of the Pampean series is not so distinctive that horizons determined by vertebrate fossils may always be recognized at localities where the fossils are absent; (4) that none of the finds involve stone cultures sufficiently distinctive from those of the modern Indians to demand recognition as being ancient.

However, Hrdlička's work was predicated on a ruling theory now known to be erroneous. He held that the physique of Early Man should be different from that of *Homo sapiens* and more or less like that of *Homo neanderthalensis* and similar forms. Since, however, the European evidence indicates that *Homo sapiens* has a very respectable antiquity, dating from the Second Interglacial at the latest (Swanscombe Skull), it is obvious that Hrdlička's ruling hypothesis is not valid. The similarity of the fossil skulls of Argentina and modern Indian types, in so far as it exists, may equally well be regarded as an argument for the persistence of early types in modern mixed races.

Argentine scientists have rested their case largely on the provenance of finds in various soft formations. Hrdlička and Willis challenged the provenance, a matter which cannot be reinvestigated from this distance. It should be noted, however, that the remains of vertebrate animals collected from the same locality by the same persons cannot be considered "modern." Various faunal associations of obviously different ages have been recovered. The age of the fauna and of the beds from which they are derived cannot be surely correlated with the North American and European Tertiary and Pleistocene chronology. The situation is neatly put by Simpson,[2] who points out that strictly South American forms inherited from the Cretaceous and Early Tertiary begin to die out and are replaced by North American forms in the late Tertiary and Pleistocene. South American forms invaded North America in the Early Pleistocene. Thus there is a basis for correlation which is as yet not absolute by reason of the lack of extensive collections from northern South America.

The question of very early man—of Tertiary age, as advocated by Ameghino, or even of Early Pleistocene age—has been summarized by Simpson.[3] He points out that the problem revolves around two formations, the Chapadmalensian (Chapadomalalan) and Montehermosensian. Both of these formations are regarded by Simpson as Pliocene in age, although there is a possibility that the younger Chapadmalensian is Early Pleistocene. As Simpson says, "there are three principal schools: (1) those who believe, with Ameghino, that these stages are Tertiary and that man was contemporaneous with them (e.g., Castellanos); (2) those who agree as to the evidence of Chapadmalan or of Chapadmalan and Montehermosan Man, but deny that these stages belong in the Pliocene (e.g. Frenguelli), and (3) those who deny the validity of the evidence for man during these stages (e.g. Hrdlička)."

The much-argued finds in soft beds of the Argentine pampas do not give as yet a sure measure of antiquity, although recent work gives hope that the alternatives posed by Simpson may be resolved. However, the relatively recent work in the Gruta de Cadonga presents evidence of men who lived in Argentina at a time sufficiently remote that the climate differed from that of present times. Here is a proved antiquity that compares favorably with some of the finds in North America or with those of Bird in Chile and Argentine Patagonia.[4] The facts and inferences brought out in the work of Castellanos[5] are here reviewed.

THE GRUTA DE CADONGA

The Gruta de Cadonga is a cave in the Province of Córdoba. It lies about 20 m. below the top of a rough, brush-covered hill which rises some 100 m. above its surroundings and is part of a hilly divide overlooking an extensive plain to the east. Streams flow eastward to the plain, and it is assumed that in former times springs broke out close to the cave to furnish a local water supply.

The cave was discovered in 1917 by Lt. (now Lt. Col.) Anfbal Montes, an Army engineer officer who removed half a meter of loose material in order to effect an entrance. In the next twenty-two years no further excavation took place, and Col. Montes assured himself that the cave was seldom visited and remained undisturbed as he made annual visits on hunting trips. In 1939 he began systematic excavation and, realizing the archaeological importance of the site, obtained the help of Dr. Juan Olsacher, Director of the Museum of Natural Sciences of Córdoba. The excavation is their joint work. The cave was visited in the same year by Castellanos, whose description is here followed and whose section of the deposits is redrawn in Fig. 5.

The cave is developed by solution on an east-west joint in folded crystalline limestone (marble). It has a narrow opening, 1.8 m. wide, and extends westward 10 m. to a blind end. In front is the so-called "vestibule," a trench with rock walls 4 m. long which widens from 1.8 to 4 m. The deposits within the cave and in part of the vestibule consist from top to bottom of the following:

4. Humus-bearing earth, containing pottery attributed

[1] Ales Hrdlička *et al.*, *Early Man in South America*, Bureau of American Ethnology, Bulletin 52, 1912.

[2] G. G. Simpson, "Mammal-Bearing Tertiary of South America," *Proceedings of the American Philosophical Society*, Vol. 83, pp. 649–709, 1940.

[3] *Ibid.*, p. 698.

[4] Junius Bird, "Antiquity and Migrations of the Early inhabitants of Patagonia," *Geographical Review*, Vol. 28, pp. 250–275, 1938.

[5] Alfredo Castellanos, *Antigüedad geológica del yacimiento de los restos humanos de la Gruta de Cadonga (Córdoba)*, Publ. Inst. de Fisiographía y Geol., Univ. Nac. de Litoral, No. 14, 1943.

to pre-Spanish time (Arianensian).

3. Reddish earth, containing pottery attributed to the Aymarensian.
2. Reddish compact earth, without pottery, containing fragments of bone and the dermal bones of a *Mylodont;* also freshwater shells of living local species.
1. Calcareous sandy clay, having a marked content of volcanic ash and with calcareous concretions, containing bone arrow (?) points, scrapers, bones of extinct animals, and a part of the skull of a child.

Numbers are used for convenience and clarity in this account; they were not used by Castellanos.

The lower compact bed (No. 1) is separated from the upper beds by a strong erosional disconformity. This bed,

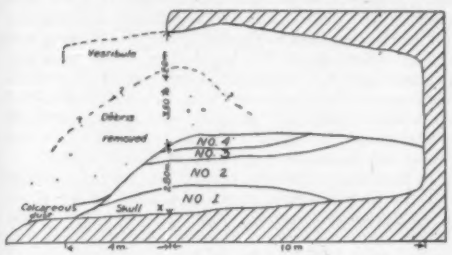


FIG. 5.—The Gruta de Cadonga.

by reason of its cementation and fossil content, has a strong a priori claim to some antiquity. Its separation from the upper beds by an erosional break and its distinctive lithologic character make it unlikely that there has been any mixing of the contained bones or artifacts by natural processes or by the excavators.

Castellanos points out that the broken and fragmentary character of the bones, the fact that some of them are burnt, and the presence of a hearth, discovered by Montes and Olsacher and confirmed by his own observation, indicate that the bed accumulated during human occupation. He has identified the bones—no easy task, as only one species, an extinct horse, is represented by teeth. There are thirteen species, of which five are living. Of the eight extinct species, four occur in the Bonarensian; two in the Platensian, a younger horizon; one in both horizons; and one is known only from horizons lower than the Bonarensian. He concludes that the bed (No. 1) is the equivalent in time of the Upper Bonarensian or basal Platensian formation. These horizons, long recognized by Argentine geologists, are involved in the difficulties of correlation of the Pampean formations already mentioned. Their age is discussed in a later paragraph.

The detailed interpretation of the cave deposits by Castellanos[6] provides an interesting sequence of events. He believes that the material of the basal bed (No. 1) was carried into the cave by its human inhabitants in order to level the floor and provide drainage. The material is compact and reddish in color. It contains: clay, 30 per cent; medium and fine sand, 45 per cent; disseminated calcium carbonate, 25 per cent. Diatoms, volcanic glass, and numerous minerals characteristic of igneous and metamorphic rocks have been found under the microscope. Thus it corresponds in every way to the loess of the pampas, and it seems likely that the direct intervention of man was not necessary for its accumulation. It is probably wind-borne dust, induced in part by the trampling of areas near the entrance by man. Castellanos believes that, after the material was in place, the concretions of calcium carbonate formed by reason of an increase in moisture. Also, he holds that the next higher bed (No. 2) was formed under wet conditions, as it contains much organic matter and many invertebrate shells.

The position of these beds in the chronology of the Pleistocene and Pliocene is uncertain. Many vertebrate fossils have been collected from flat-lying beds underlying the pampas of Argentina. Several distinct faunas are recognized and attributed to horizons ranging in age from Tertiary to Recent. The "Pampean" formations consist of alluvial and loessial beds and are considered to be of Pleistocene age. Simpson[7] considers that the Pampean formations including the Ensenadensian, Bonarensian and post-Pampean (Platensian, etc.), are without doubt Pleistocene in age. Willis[8] doubted the identification of the horizons at a distance from fossiliferous localities. He also claimed that, because of slumping on cliffs and other present-day processes, fossil bone of earlier formations was carried into late and very recent deposits, which were therefore quite wrongly attributed to epochs earlier than that to which they belonged. Such errors in field study are not uncommon in any region, but it is obvious that Willis emphasized such errors because he believed that all the human skeletons and parts of skeletons found in Argentina were of very recent date. The Gruta de Cadonga provides what is apparently unassailable proof of the association of a human skull and artifacts with an extinct fauna. That the skull is of the *Homo sapiens* type and has a deformation of the "Aymara type" does not invalidate the association. The bone points are not necessarily ancient, but bone points of similar aspect occur with the oldest North American culture, the Sandia.

Willis' remarks on the characteristics of the Pampean formations thus become of very great interest. He states that the lower Pampean (Ensenadensian) rests disconformably on the older, largely marine Tertiary. It is an alluvial formation containing many beds of loess. It is cut by broad valleys in which the Upper Pampean (Bonarensian, etc.)—a similar partly alluvial, partly loessial, formation—is deposited. The Upper Pampean is in many places eroded by streams in more than one stage. It is also subject to local wind erosion and is covered here and there by modern wind deposits.

Willis recognizes that the Pampean represents a series of episodes which may be correlated with climatic fluctuations. His sequence is shown in the accompanying table.

TABLE OF EVENTS, AFTER WILLIS

Episode (Cycle)	*Material or Process*	*Inferred Climate*
N+6	Black earth	humid (present)
N+5	Formation of tosca "caliche"	arid
N+4	Wind erosion and loess deposit	semiarid to arid
N+3	Lacustrine	humid
N+2	Wind erosion and formation of tosca "caliche"	semiarid
N+1	Brown earthy loess and alluvium	humid
N	Erosion at base of Pampean	no inference made

[6] *Ibid.*, pp. 19–25.

[7] *Op. cit.*

[8] In Hrdlička *et al.*, *op. cit.*

This sequence begins with the erosion of the slightly deformed upper Pliocene beds, which are in large part marine and whose age is determined on the basis of marine fossils and of the correlations of vertebrate fossils. The N+1 episode is the deposition of the brown earthy loess and alluvium of the lower Pampean or Ensenadensian. It is assumed that a humid climate like the present is required for the deposition of the loess. The N+2 episode is the deposition of lime (tosca) in the form of concretions and plates in the Ensenadensian, accompanied by wind erosion. Tosca is an accumulation just below the surface much like the caliche of our Southwest. A semiarid climate is assumed. The N+3 episode is presumably the deposition of lacustrine beds, but the only formation containing such beds is the Luganensian in the vicinity of Buenos Aires. Castellanos believes, on the basis of a correlation of vertebrate faunas, that this formation has a loessial equivalent to the west, the Bonarensian. If the Bonarensian is Willis' N+3, one would expect that it would also include N+4 and that the formation of tosca and the erosion surface above are N+5.

However, Willis' sequence of events has no place for the Platensian, a well-established formation later than the Bonarensian. It is obvious that Willis' series of events is incomplete, but its essential feature—the correlation of the loessial formation and their separating disconformities with fluctuations of climate—is without much doubt correct. The number of fluctuations of climate during the Pleistocene recorded in other parts of the world, is however, much greater than the number given in Willis' list, and one would expect that more would be represented in the Argentine.

Caldenius, in an admirable discussion,[9] confirms this association of climatic episodes and deposition. He shows that the Tehuelche formation[10] was once a continuous sheet of gravel extending eastward from the mountains and was laid down by streams presumably associated with the first glaciation. It is now dissected and exists as remnants which rise above, and are older than, the pampas and their underlying loess. The formation is affected by wind erosion and frost action attributable to later glaciations. The loesses of the pampas are deposits of dust laid down mostly to the eastward of this area by wind action. He presents the truly difficult and as yet unsolved problem of the pampas. Is the wind action of the present, and of climates like the present, the cause of loess formation, or is loess formation the result of a glacial climate? This question cannot be answered for Argentina on the basis of available data. Caldenius' work, however, shows that the hypothesis of climate as a dominant influence in the production of the formations of the pampas is valid.

Returning to the Gruta de Cadonga, it appears that the lowest layer was deposited, presumably as dust, during the occupation of the cave by man and during the life of animals now extinct. The deposit contains so much calcium carbonate that a wetter cave and hence a wetter climate at the time of occupation or immediately thereafter are indicated. The fauna indicates a correlation with loessial beds of the upper Pampean presumably deposited in the fluctuating climate of the past—to what part of the past still remains an open question. Castellanos refrains from comment in his text, but in his "summary"[11] he attributes deposition to the interglacial between the Riss and Würm. Such a dating seems much too early in the light of North American data, which so far indicate the second interstadial of the Fourth Glacial as the earliest date for the entrance of man into the New World.[12] It is obvious that correlation of the Pampean formations with glacial episodes in the glaciated Cordillera to the west is possible. A climatic rhythm similar to that postulated by Willis, but probably much more complicated, affected the pampas during the Pleistocene and continued to very recent time. Correlation of soft formations with each other and with the glacial episodes of the mountain area to the west involves an enormous and long-continued effort. The work of our Argentine colleagues in this task should be viewed with sympathy and understanding of the difficulties. At the cave of Cadonga they have established a sure association of man and an extinct fauna. The situation is similar to that at Ventana Cave,[13] where cemented beds containing artifacts and bones of extinct animals are separated by an erosional break from upper, softer material containing the artifacts of later groups. In both caves, man lived with animals now extinct and was involved in a series of climatic events.

To attempt a correlation between the cave of Cadonga and the archaeological sequence established by Bird[14] in southernmost Patagonia would be premature. Bird's culture of Period I is characterized by stone tools and projectile points. The closely associated skeletons are of dolichocephalic, heavy-featured *Homo sapiens* types. Native horse, sloth, and guanaco are associated in a compact deposit, in places containing a volcanic ash. The presence of horse and sloth at Cadonga is not sufficient evidence of contemporaneity. All that we may be sure of is that a definite association of man and extinct animals has been determined in both localities.

With the cave of Cadonga as an assured starting point, the Argentines are in the advantageous position in which North Americans found themselves after the discovery at Folsom. They can look forward to new finds and new studies with a sure and familiar point of reference from which the new may be judged in the light of what is known.

KIRK BRYAN
Geological Museum
Cambridge, Massachusetts

[9] Carl Caldenius, "The Tehuelche or Patagonian Shingle Formation," *Geogr. Annaler*, Vol. 22, pp. 160–181, 1940.

[10] It is obvious from Simpson's discussion that the term Tehuelche is used in many senses. Others might dispute Caldenius' use of the term, but the high gravels to which he refers have long been recognized.

[11] *Op. cit.*, pp. 5–6.

[12] Kirk Bryan, "Correlation of the Deposits of Sandia Cave, New Mexico, with the Glacial Chronology," appendix to F. C. Hibben, "Evidences of Early Occupation in Sandia Cave," Smithsonian Miscellaneous Collections, Vol. 99, No. 23, pp. 45–65, 1941.

[13] Emil W. Haury, "Stratigraphy of Ventana Cave, Arizona," AMERICAN ANTIQUITY, Vol. 8, pp. 218–223, 1943.

[14] *Op. cit.*

AN UNUSUAL SIDE-BLADED KNIFE FROM A PROTOHISTORIC MANDAN SITE

In 1938, a seemingly unusual type of side-bladed knife with its stone blade in place was excavated at the Old Fort Abraham Lincoln Mandan village, across the Missouri River from Bismarck, North Dakota. This specimen, now in the collections of the North Dakota Historical Society, was found in an ash-filled storage pit at a depth of 90 cm. The same pit also contained two other side-bladed knife handles of bone and three ovoid stone knife blades, as well as other artifacts, some indicating European contact. The Old Fort Abraham Lincoln village is of protohistoric age and was occupied by the Mandan prior to 1800. The general characteristics of the site and the excavations in question

have been outlined elsewhere.[1] The present specimen (Fig. 6, *left*) is distinctive in that the lanceolate blade of Knife River flint is so inserted that one corner of the butt serves as the cutting corner or point of the knife. When the specimen was found, the blade lay with a corner of the butt and the point fitted into the bottom corners of the slot in the bone so that it was locked into place in the handle. The photograph (Fig. 6, *left*) shows the blade withdrawn enough so that it is wholly visible. A layer of dark material in the bottom of the slot may be the remains of glue. While Mandan and northern Great Plains side-bladed knives usually have an ovoid or rectangular blade, triangular blades of copper, mounted butt forward, are also on record.[2]

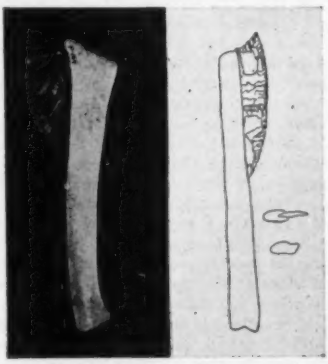


FIG. 6.—Side-bladed knives. *Left*, unusual specimen found in situ, Old Fort Abraham Lincoln village of the protohistoric Mandan (length, 7⅞ inches); *right*, bone knife with inset flint blade pertaining to Servoski stage, Early Neolithic, Lake Baikal region (After Oklandikov, from Collins, 1943, Fig. 5, No. 2).

Attention is called to this specimen both because of the unexpected manner of utilizing a blade that would normally be classified as a point and because the limited available evidence bearing on the distribution of the side-bladed knife in time and space in America needs further examination. In a recent article, Collins discussed this problem of distribution and arrived at the conclusion that the Eskimo had acquired the side-bladed knife as early as the beginning of the Christian era from sources in Siberia. The type occurs in the Lake Baikal district in early Neolithic horizons, somewhat subsequent to 6000 B.C.[3] Presumably the late side-bladed knife of the northern plains was diffused from the Eskimo. Strange to say, the specimens in the Siberian Neolithic[4] seem very similar to side-bladed knives from historic and protohistoric sites pertaining to the Mandan, Arikara, Cheyenne, and other northern Great Plains tribes. Further, I know of no exact analogies to the butt-forward protohistoric Mandan specimen under discussion other than examples from these same Siberian horizons (Fig. 6, *right*). From, say, 5000 B.C. in Siberia to *circa* 1700 A.D. in North Dakota is indeed a far cry, and it may be that such resemblances, though striking, are fortuitous.

On the other hand, outside those regions where frozen ground or arid conditions preserve them, handles of bone and wood are extremely perishable, and it may be that the prehistoric record of the side-bladed knife in North America, outside the Arctic, has been obscured by this fact and actually goes far back of the late Promontory Point culture[5] and the evidences of bones with side slots recorded for the Nebraska culture by Gilder and Sterns.[6] In addition to suitable points, other types of stone artifacts quite suitable for side blades, although they are usually classified as ovoid side scrapers or flake knives, occur commonly in the various early Plains and other horizons as far back as Signal Butte I[7] and the Folsom culture.[8] There is no proof as yet that they were so used, but, in those few but important discoveries where even fragments of worked bone or wood are preserved, such proof may exist or be forthcoming. Until then, we are faced either with acceptance of a late independent invention of the side-bladed knife in central North America or with the hypothesis that, although the idea of the side-bladed knife was borrowed by the Eskimo some 2000 years ago, it was transmitted to central North America only in very late prehistoric times. If the latter were true, perhaps people with a northerly culture such as Promontory Point is thought to be brought the idea south, where, in the northern Plains, it suddenly developed forms identical with those found in the early Siberian Neolithic. Personally, I believe it is possible that the idea of the side-bladed knife reached central North America considerably earlier, perhaps prior to the advent of the Eskimo themselves. However, if this is so, the fact has been successfully masked by the paucity of hafted specimens or hafts recovered in earlier horizons and can only be demonstrated by future discoveries or more careful analysis of existing collections.

BIBLIOGRAPHY

BROWER, J. V.
1904. *Mandan.* Memoirs of Explorations in the Basin of the Mississippi, Vol. 8.

COLLINS, HENRY B., JR.
1943. "Eskimo Archaeology and its Bearing on the Problem of Man's Antiquity in America." *Proceedings of the American Philosophical Society*, Vol. 86, No. 2, pp. 220–235.

ROBERTS, FRANK H. H., JR.
1935. *A Folsom Complex. Preliminary Report on Investigations at the Lindenmeier Site in Northern Colorado.* Smithsonian Miscellaneous Collections, Vol. 94, No. 4.
1936. *Additional Information on the Folsom Complex. Report on the Second Season's Investigations at the Lindenmeier Site in Northern Colorado.* Smithsonian Miscellaneous Collections, Vol. 95, No. 10.

STEWARD, JULIAN H.
1937. *Ancient Caves of the Great Salt Lake Region.* Bureau of American Ethnology, Bulletin 116.

STRONG, WM. DUNCAN
1935. *An Introduction to Nebraska Archeology.* Smithsonian Miscellaneous Collections, Vol. 93, No. 10.
1940. "From History to Prehistory in the Northern Great Plains." *Essays in Historical Anthropology of North America*, Smithsonian Miscellaneous Collections, Vol. 100.

WM. DUNCAN STRONG
Columbia, University
November, 1944

[1] Strong, 1940, p. 365.
[2] Collins, 1943.
[3] Brower, 1904, p. xviii.
[4] *Ibid.*, Figs. 3, *a*, *b*; 4, No. 7.
[5] Steward, 1937, p. 74.
[6] Strong, 1935, p. 261.
[7] *Ibid.*, Pl. 25, No. 1, *f*, *g*.
[8] Roberts, 1935, Pls. 11, 12, 14, 15; 1936, Pls. 5, 6.

BOOK REVIEWS

The Hogan Builders of Colorado. BETTY H. and HAROLD A. HUSCHER. (Southwestern Lore, Volume 9, Number 11, September, 1943. Gunnison, Colorado.)

This paper is well worth the time of anyone interested in American archaeology. It gives the results of several years' work, and is by far the most detailed report on the subject yet to come to the attention of the reviewer. Its conclusions are important from two standpoints: They give, first, an explanation of the stone circles which have been mentioned in reports on the Southwest for many years, but which have never been associated with any culture. Secondly, their conclusions fill in a time gap in Southwestern history which has been too long unexplained.

Stone enclosures found in all parts of the Southwest are believed to be remains of stone hogans left by a group of southern Athapaskans over a period of many years as they moved southward, following the mountain ranges. The earliest positive sign of their arrival in Colorado is dated at 1100 A.D. on the basis of associated pottery. Occupation of the state by the Hogan Builders extends from late Basket-maker-Pueblo to historic times, when the Ute were found in western, the Cheyenne and Arapaho, in eastern Colorado.

Sites of the Hogan Builders are houses with circular or curvilinear walls of stones laid up without the use of adobe mortar. They are found on mesa rims, hilltops, or steep-sided bluffs. All sites examined by the authors lie in the mountainous regions of southern and western Colorado, mostly on the western side of the Rocky Mountains. Extensive research in the literature has shown that similar dwellings are found in all parts of the Pueblo Southwest, and that they were observed in historic times by the Spanish and others. This type of ruin is considered to be a stable house form.

Sites are found in six river drainages. Each region is discussed in detail. The sites are described, and, in addition, there is a thorough review of all historical data concerning the sites and the region in general. The historical approach has served the authors quite well in this case, and they have been most thorough in their treatment.

Sites vary in the different regions, but their general characteristics are the same. The outline of the hogan is marked by stones of varying height. Some sites have many dwellings, others, few; some are surrounded by an inclosing wall, while others are not.

The material from each site is discussed and the general traits are compared with those of other cultures. The Hogan Builders, however, left little in the way of artifacts. Points are small and corner-notched; scrapers are similar to those of the Promontory culture. The majority of the implements is of bone. Many artifacts are similar to those of the Colombia River region. The majority of the pottery is of known Pueblo types; the oldest sherd is dated at 1100 A.D. Other types, including a black-cored, surface-manipulated pottery, are compared to "eastern woodland" pottery

A survey of similar ruins found in the western states includes a most complete listing of all finds and a discussion of the ways in which they differ.

The next section consists of a discussion of traits. Although some houses are only six feet in diameter while others are half a hundred, we are reminded of the brush-inclosed corrals of the Apache noted by Oñate in 1601. Many of the excavated houses lacked hearths or middens, probably because household activities were carried on elsewhere and because the locations of the sites on high ground would allow much material to wash to a lower level.

Conclusions reached by the Huschers are so evident as to make one wonder why this paper was not written many years ago. The following facts are presented: In the Southwest, stone hogan sites are found upon and along the mountain ranges. Associated pottery has established the earliest date for the Hogan Builders as 1100 A.D., but they were probably in the region before that time, and may have influenced earlier cultures. A thorough examination of Ute sites, and the fact that there has been no reported occupation of these hogan sites by modern peoples, establishes an upper horizon for occupance of the Hogan Builders.

In a competently handled attempt to determine the identity of the builders of the hogans, the authors discuss three similar cultures: the Promontory culture of the Great Salt Lake region; the Fremont river culture of southeastern Utah, with a subarea in northeastern Utah; and the culture of the upper Arkansas River. Three groups of Indians are then considered from the standpoint of their responsibility for building the stone hogans: The Pueblo are eliminated because of differences in their masonry and house styles, their use of adobe, and the lack of similarity in other traits. The modern Shoshoneans are rejected on several grounds, summed up by Steward's statement that "the Promontory or Puebloid remains of the Northern Periphery are too disparate and an enormous degree of deculturation would have to be postulated." The third group is the Southern Athapaskans we now call Navaho and Apache. Evidence is presented to show that the distinction between the two tribes is recent. As the appearance of these tribes corresponds in time with the upper dating of the Hogan Builders, the authors examine the evidence relative to different Athapaskan movements and the various opinions concerning their routes. Their complete discussion fairly presents the evidence for and against Athapaskan responsibility for the hogans. Both archaeological and ethnological evidence point to a prehistoric meeting between Athapaskan and Puebloan cultures which resulted in an end product represented by the Navaho.

The authors believe that this complex should be given a position as a distinct entity with the status of a pattern and that its name should reflect its wide distribution and its probable northern provenience. Four foci are recognized. Sites on the Rio Grande may have counterparts in sites found by Renaud on the Arkansas.

The authors' treatment of past reports and historical evidence is complete and impartial, in which respect many writers in the past have failed. Conclusions are not based alone on the material found at the sites. Despite the lack of hearths and middens, the writers, although mentioning alternatives suggested by Renaud in his report on similar sites along the Arkansas, do not admit the possibility that the sites could have been anything other than dwellings. Because of their belief that the structures were dwellings, the authors, in several instances discuss types of roofs, and other hogan traits for which no evidence is present.

If it is granted that the structures under consideration constitute a stable house type, the treatment of the subject is complete and conclusions are logically developed. The

authors are to be congratulated on this report. It is a definite contribution to our knowledge of archaeology in the Southwest.

R. M. TATUM
U. S. Naval Academy
Annapolis, Maryland

The Manufacture of a Flint Arrowhead by Quartzite Hammerstone. SIR FRANCIS H. S. KNOWLES. (Pitt Rivers Museum, University of Oxford, Occasional Papers on Technology, I. Edited by T. K. Penniman and B. M. Blackwood. Oxford: Oxford University Press, 1944. 5 shillings.)

This is the first in a series of papers concerning techniques employed in the manufacture of aboriginal implements and ornaments. If the following numbers in this series are as clearly and interestingly presented as the first it will be an extremely worthwhile project. Knowles has couched his descriptions of primitive stoneworking methods in terms which can be readily grasped by the layman. At the same time, he has included technical information on his subject gathered through years of experimental work in the actual manufacture of chipped stone implements.

The present paper covers in detail only one phase of flint working—the manufacture of an arrow point from a double-ridged flake similar in shape to those struck off in the making of gun flints. While Knowles suggests that the reader consult the monographs by Skertchley[1] and Clarke[2] concerning the making of these flakes by the Brandon flint knappers, he modestly overlooks the fact that his own experience and association with the knapping of gun flints has been considerable.[3]

The production of a chipped arrow point or blade from a double-ridged flake is divided by the author into five stages: striking the flake from the quarter or core of flint; flaking away the edge; striking off the upper face of the flake; turning the edge in the reverse direction; and striking along the turned edge, thus flaking across the bulbar face of the flint.

The removal of the flake from the core follows the method used in the modern production of gun flints, substituting a quartz hammerstone for the steel quartering hammer and placing the point of impact fairly well back from the edge of the striking platform so that the flake removed is of somewhat greater thickness than those used in producing gun flints.

This flake is then held with the flat or bulbar side down and chipped lightly around the edges to form a striking platform at a slight angle to the bulbar face, but on the same side of the flake. The flake is then reversed in the hand and carefully chipped on this newly formed striking platform so that the chips are removed across the ridged surface of the flake, obliterating the ridges.

The flake is again reversed, side for side, and the edges are again "turned" by removing small chips along the edge of the former ridged surface. This produces a striking platform which may be utilized by reversing the flake and striking off chips which run across the bulbar surface. The final notching, if it is to be done, is the result of pressure flaking with an antler tip which, as the author points out, is hard enough but will not readily slip.

[1] S. B. J. Skertchley, "The Manufacture of Gun Flints," *District Memoir of the Geological Survey of England and Wales*, 1879.

[2] Rainbird Clarke, "The Flint Knapping Industry at Brandon," *Antiquity*, Gloucester, March, 1935, pp. 38–56.

[3] Sir Francis H. S. Knowles, "Manufacture of Gun Flints," *Antiquity*, Gloucester, June, 1937, pp. 201–207.

This report is brief and to the point and is accompanied by excellent line drawings and bibliographical notes to aid the reader who might be interested in pursuing the subject at greater length. The author and the Pitt Rivers Museum are to be commended for a job well done.

I. HOLMES ELLIS
Grand Rapids, Michigan

An Introduction to the Ceramics of Tres Zapotes, Veracruz, Mexico. C. W. WEIANT. (Smithsonian Institution, Bureau of American Ethnology, Bulletin 139. xiv+144 pp., 78 plates, 54 figures, 10 maps. Washington, 1943.)

Ceramic Sequences at Tres Zapotes, Veracruz, Mexico. PHILIP DRUCKER. (Smithsonian Institution, Bureau of American Ethnology, Bulletin 140. ix+148 pp., 65 plates, 46 figures. Washington, 1943.)

Ceramic Stratigraphy at Cerro de las Mesas, Veracruz, Mexico. PHILIP DRUCKER. (Smithsonian Institution, Bureau of American Ethnology, Bulletin 141. viii+95 pp., 58 plates, 210 figures. Washington, 1943.)

These three monographs detail a portion of the results obtained by National Geographic Society—Smithsonian Institution expeditions to southern Mexico under the direction of Dr. Matthew Stirling. The expeditions began in 1939 and have continued every year through 1944. Progress reports and accounts of the many spectacular finds, including stone monuments and extraordinary objects of jade, have appeared from time to time in the National Geographic Magazine, and Dr. Stirling has recently published a full account of the stone monuments in Bulletin 138 of the Bureau of American Ethnology.

The papers under review are detailed reports on the ceramics and ceramic stratigraphy at two of the three large sites investigated during these expeditions. They are detailed analytical studies of high quality, and their importance to Middle American archaeology can hardly be overestimated. They are perhaps of greater significance than those who are not specialists in Middle America will realize, and it might be well to begin by pointing out some of the circumstances, other than the quality of the work itself, which contribute to that importance.

The area of central and southern Veracruz is almost unbelievably rich in archaeologic sites and is one from which unusually fine sculptured stones, carved jades, and fine ceramics have come, indicating the presence of highly advanced cultural entities. This wealth of fine materials in the area has been apparent for many years but has been emphasized by the finds of the expeditions which have resulted in these ceramic studies. This area is of strategic importance also because of its intermediate position between the archaeologically better-known Central Mexican and Maya areas, and because it is the place of origin of the Tuxtla statuette and Stela C at Tres Zapotes, both of which, if correctly interpreted, bear Initial Series dates earlier than any in the Maya area proper. These considerations, as well as others which cannot be gone into here, make the southern Veracruz area one of great potential importance in regard to many highly significant problems such as the place of origin of the calendar systems and of the origin of various other elements of the high cultures of Middle America.

The appearance of the first detailed stratigraphic studies from such an area is an event of considerable importance. As a matter of fact, it might be said that these reports are the first full-length monographs on ceramic stratigraphy that have been published for all of southern Mexico, includ-

ing the states of Tabasco, Chiapas, Central and Southern Veracruz, Tlaxcala, Puebla, and Oaxaca. I do not mean to say that the ceramics of this great area are entirely unknown. Important collections have been described and extensive stratigraphic work has been done by Caso and his associates at Monte Alban; by Noguera at Cholula; and by Garcia Payón, Du Solier, and Valenzuela at other sites; but none of these stratigraphic studies have been published in detail and do not as yet form an available corpus of data which can be used for detailed comparisons. This is the situation despite the fact that ceramic stratigraphy appears to be the technique most likely to produce an accurate historical outline for the area.

Weiant was Stirling's assistant on the first expedition to Tres Zapotes in 1939, and his study is based on the ceramic material obtained during only that first season. Drucker filled a similar position on the second expedition to the same site in 1940, and his report was written independently and includes reference to only a small amount of the material described by Weiant. We therefore have the unusual situation of two full-length ceramic reports on a single site. The two authors have approached the problem in different ways, with different amounts of experience, and from different points of view. Drucker had the advantage of the previous season's work and apparently devoted his time entirely to the working out of a detailed ceramic sequence, while Weiant's work during the first season was largely exploratory in nature.

Beyond question, Drucker's report is based on the more comprehensive body of evidence and gives us the more accurate and detailed outline of Tres Zapotes history. My advice to anyone attempting to use these reports is that he go first to Drucker for the more complete study and then to Weiant for additional material, particularly for the last period of occupation at the site and for Weiant's more extensive comparisons with material in other areas.

Drucker sampled all parts of the Tres Zapotes site, and the large size and number of his test pits and stratigraphic trenches are very impressive. He has divided the history of the site into two principal periods. The earlier was a long occupation by a slowly evolving culture which he calls Tres Zapotes and which he divides into three phases—Lower, Middle and Upper. Then, after the site was deserted for a considerable period, it was reoccupied by another group with a different cultural tradition, the Soncautla complex.

Lower Tres Zapotes is thought to show many linkages with the Mamom-Chicanel phases of Uaxactun and relatively few with the early phases at Monte Albán and in the Valley of Mexico. Drucker postulates, therefore, " . . . an early lowland pattern that extends as far south and east as the Petén and the Ulua Valley, which forms a unit as contrasted to the early highland complexes as manifested at Kaminaljuyú, Monte Albán, and the Valley of Mexico." The Middle phase is considered by Drucker to be merely transitional, while the Upper phase, containing a number of traits apparently derived from Teotihuacan, is thought to have come to a close previous to the distribution of Plumbate pottery or metals, or, in other words, previous to the Aztec I—Mazapan or the Tula-Toltec horizon. The uncomformable Soncautla complex represents a short occupation referrable to the Cerro Montoso or Cholula Polychrome horizon and in part to that tradition.

Drucker's paper on Cerro de Las Mesas is another highly analytical study in which he breaks down the ceramic history of the site into two periods—Lower and Upper—each of which is subdivided into two phases. He shows that the Lower period is associated in time with the late Middle and Upper portion of the Tres Zapotes sequence, while the Upper period corresponds to the Cholulteca levels at Cholula, from which there appears to have been considerable influence. The Cerro de las Mesas material as a whole shows much more highland influence than was apparent at Tres Zapotes. Of great importance was the finding of a stone yoke, *hachas*, and laughing face figurines, as well as a great cache of jade objects in contexts placing them in the Lower II horizon, the first definite association we have had for these highly important elements.

We can hardly overemphasize the importance of these studies of Drucker's to Middle American archaeology, and I have very little in the way of criticism to offer in regard to his methods of excavation and analysis of the material. For the benefit of those not acquainted at first-hand with large Middle American sites, it might be well to point out that the ceramic material occurs in them in such large quantities that it is impossible to describe it all. Consequently, a great deal of reliance must be placed on the excavator and author for an adequate selection of the important elements for description and for their interpretation, and it is my definite opinion that Drucker has discharged his responsibility most skilfully and understandingly.

I have only one criticism to make of the Tres Zapotes study, and that is that the ceramics are classified into such broad groupings—*wares*, according to Drucker—that it will be rather difficult to make comparisons with pottery from other sites. This classification into very inclusive groups was obviously done because of the unusually poor preservation of the sherds at Tres Zapotes and was rationalized to some extent, I believe, by the avowal of interest primarily in the evolution of the pottery of the Tres Zapotes site only. Actually, the Tres Zapotes sequence is meaningful only as it can be fitted into the development of Middle American cultures as a whole, and from this point of view a division of the pottery into smaller and more precise groupings would have been better. The classification was much more satisfactorily done in the study of Cerro de las Mesas where, it is true, the sherds were in a more normal state of preservation.

In my opinion, Drucker has used a very unfortunate system of nomenclature for the subdivisions of the Cerro de las Mesas sequence, one that will cause no end of irritating confusion. The principal divisions of the sequence are called Upper and Lower, but the subdivisions are indicated with the Roman numerals I and II. Lower II, for instance, refers to the upper subdivision of the Lower period, although in customary usage this would mean the lower portion of phase II. As far as I can see, this system is exactly opposite from the common method of naming time divisions and is used for no good reason.

To summarize, these reports are unusually significant because of the great gap in our knowledge of Mexican ceramics which they begin to fill, and because they are competent and very well-executed studies.

GORDON F EKHOLM
American Museum of Natural History

MEMOIRS

of the

SOCIETY FOR AMERICAN ARCHAEOLOGY

The following numbers, may be obtained from the Treasurer, Frederick Johnson:

Number 1. *Big Bead Mesa: An Archaeological Study of Navaho Acculturation, 1745–1812.* By DOROTHY LOUISE KEUR. 90 pages, 4 plates, 5 figures. $1.00.

Number 2. *The Tchefuncte Culture, An Early Occupation of the Lower Mississippi Valley.* By JAMES A. FORD and GEORGE I. QUIMBY, JR., with an appendix on the Skeletal Remains by CHARLES E. SNOW. 113 pages, 12 plates, 23 figures, 3 folding tables. $1.50.

INFORMATION FOR AUTHORS

AMERICAN ANTIQUITY publishes original papers in the field of American Archaeology and in subjects related thereto, as well as comments, reviews, or discussions on matters pertaining to these fields. Fields include archaeology, ethnology, geography, and such other sciences as have bearing on man's existence or activities in the New World.

Accepted papers are published in the order of their receipt. Except for such papers as may be specially solicited, all papers bear the date of submission.

Manuscripts must be typewritten in standard 8½×11 paper, double spaced, and on one side of the page only. Bibliographies must follow a standard form. Citations from journals should be given as follows:

JENKS, ALBERT E. and LLOYD A. WILFORD
1938 "The Sauk Valley Skeleton." *Bulletin of the Texas Archaeological and Paleontological Society*, Vol. 10.

citations from separate books:

JENKS, ALBERT E.
1936 *Pleistocene Man in Minnesota*. University of Minnesota Press.

Illustrations over and above one page of halftones or the equivalent in line cuts must be paid for by the author or the author's sponsor, Photographs for reproduction should be on a glossy paper, unmounted, and of a proportion suitable for reduction to 5¾×8¾ or a portion thereof, making due allowance for captions. Line drawings should be in India Ink on smooth, hardsurfaced paper, with figures written lightly in pencil on the margin or the back. Galley proof, only, sent to authors. Reprints without covers supplied at the following prices, only when ordered with returned, corrected galley proofs.

Copies	1–4 pp.	5–8 pp.	9–12 pp.	13–16 pp.	17–20 pp.	21–24 pp.	25–28 pp.	29–32 pp.
25	$2.50	$4.15	$ 6.15	$ 6.75	$ 8.65	$10.65	$11.90	$12.50
50	3.00	4.50	6.75	7.50	9.50	11.75	13.25	14.00
75	3.25	4.90	7.35	8.00	10.40	12.90	14.65	15.50
125	3.75	5.65	8.60	9.50	12.15	15.15	17.40	18.50
175	4.25	6.40	9.85	11.00	13.90	17.40	20.15	21.50
275	5.25	7.90	12.35	14.00	17.40	21.90	25.65	27.50

Covers with title and date of issue of AMERICAN ANTIQUITY will be furnished at the following rates: 25 for $2.50; additional covers 1½ cents each. Plates, printed 1 side, 100 for $2.00; printed 2 sides, 100 for $4.00.

TABLE OF CONTENTS

Editorial 1

A Survey of the Northern Maya Area . . . . . J. Eric S. Thompson 2

Historical Significance of the Murals in the Temple of the Warriors . Donald E. Wray 25

Inscriptions at Chichen Itza and the Maya Correlation Problem . . . R. B. Weitzel 27

Three Villages of the Mississippi Pattern in Minnesota. . . . . Lloyd A. Wilford 32

The North Benton Mound: A Hopewell Site in Ohio . . . Willis H. Magrath 40

The Box Elder Mound, La Salle County, Illinois . . . . . James B. Griffin 47

Horizon Styles and Pottery Traditions in Peruvian Archaeology . . Gordon R. Willey 49

FACTS AND COMMENTS

The De Luna Expedition and Southeastern Ceremonial. . . . Antonio J. Waring Jr. 57

Recent Work on Early Man at the Gruta de Cadonga in the Argentine Republic . . . . . Kirk Bryan 58

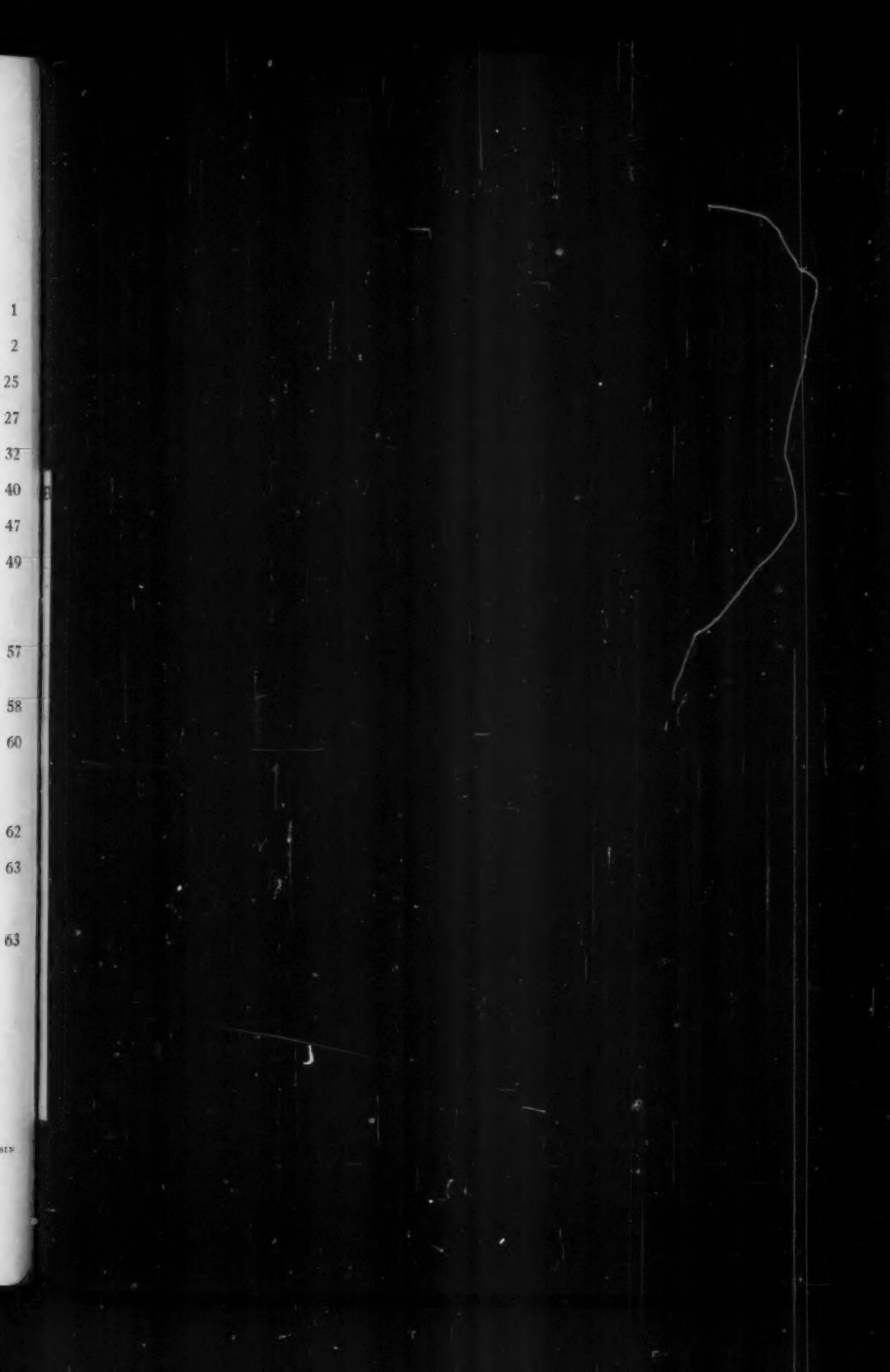
An Unusual Side-bladed Knife from a Protohistoric Mandan Site. Wm. Duncan Strong 60

BOOK REVIEWS

Huscher and Huscher: *The Hogan Builders of Colorado* . . . . . Tatum 62

Knowles: *The Manufacture of a Flint Arrowhead by Quartzite Hammerstone* . . Ellis 63

Weiant: *An Introduction to the Ceramics of Tres Zapotes, Veracruz, Mexico*
Drucker: *Ceramic Sequences at Tres Zapotes, Veracruz, Mexico* Ekholm 63
Drucker: *Ceramic Stratigraphy at Cerro de las Mesas, Veracruz, Mexico*

AMERICAN ANTIQUITY IS INDEXED IN THE INTERNATIONAL INDEX

GEORGE BANTA PUBLISHING COMPANY, MENASHA, WISCONSIN